# PHOTOFACT* FOLDER SET

*TRADE MARK

# NO. 63

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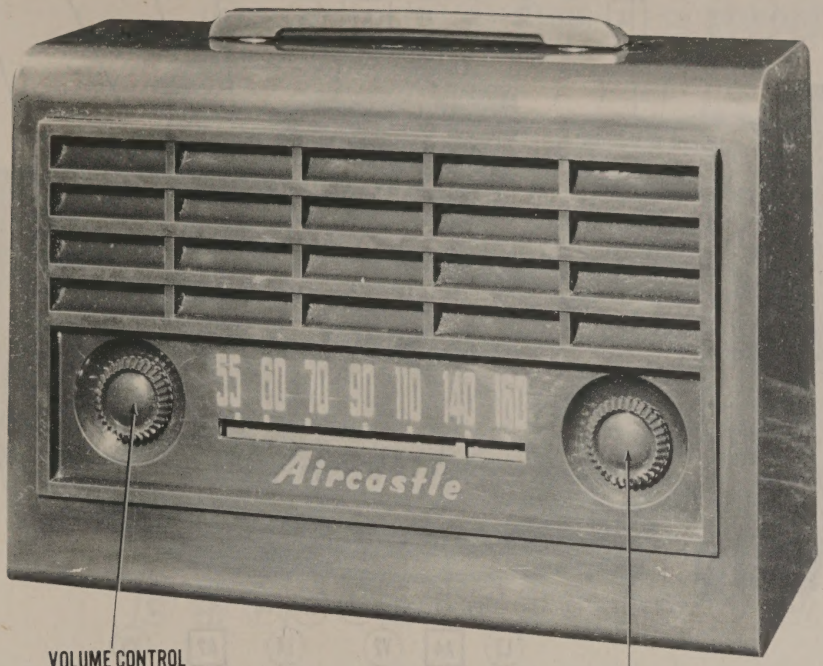


AIRCASTLE
MODEL 213

AIRCASTLE
MODEL 213

AIRCASTLE MODEL 213

| | |
|---|---|
| **TRADE NAME** | Aircastle, Model 213 |
| **SUPPLIER** | Spiegel, Inc., 1061 W. 35th St., Chicago, Illinois |
| **TYPE SET** | Three Power Operated Portable Superheterodyne Receiver with Loop Antenna |
| **TUBES** (FIVE) | Types 1R5 Converter, 1U4 IF Amp., 1U5 DET.-AVC-AF, 3S4 Power Output, 117Z3 Rectifier |
| POWER SUPPLY RATING | 105-125 Volts AC-DC or 4.5 Volts "A" Supply and 67.5 Volts "B" Supply<br>.15 Amp. @ 117 Volts AC or 1.5MA @ 4.5 Volts DC and 8MA @ 67.5 Volts DC |
| **TUNING RANGE—BROADCAST** | 535-1620KC |

**ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT**

To set dial pointer, turn tuning capacitor fully closed and set left hand edge of pointer 5/8" from the left hand edge of the dial backplate.

Use battery power when available. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1. | .1MFD | High side to rear stator of tuning gang. Low side to B-. | 455KC | Tuning gang fully open | Across voice coil | A1, A2 A3, A4 | Adjust for maximum output. If AC power is used without an isolation transformer reduce dummy antenna to 200MMF to reduce modulation. |
| 2. | .1MFD | " | 1620KC | " | " | A5 | Adjust for maximum output. |
| 3. | | Loop | 1500KC | Tune for maximum signal | " | A6 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |

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# PARTS LIST AND DESCRIPTIONS



## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: AIRCASTLE PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| V1 | Converter | 1R5 | 1R5 | 7AT | |
| V2 | IF Amp. | 1U4 | 1U4 | 6AR | |
| V3 | DET.-AVC-AF | 1U5 | 1U5 | 6BW | |
| V4 | Power Output | 3S4 | 3S4 | 7BA | |
| V5 | Rectifier | 117Z3 | 117Z3 | 4BR | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: AIRCASTLE PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | 40 | 150 | CE-17 | PRSA150/40-40 | DL4415 | | DSB-2x40-150 | TA-440 | Filter Green |
| B | 40 | 150 | | PRS12/250 | BRH1225 | | M-250-12 | TVA-3 | Filter Red |
| C | 200 | 10 | | | | | | | Filament Bypass |
| C2 | 47 | 500 | CM-470-1 | 1468-00005 | 5W5Q5 | GP1K-50 | MO.5-45 | 1FM-45 | Osc. Grid Cap. |
| C3 | .01 | 150 | CP-103-2 | P288-01 | GT2S1 | GP2-335-01 | ST-4-01 | 68P14 | Osc. Anode Decoupling |
| C4 | .05 | 200 | CP-503-2 | P288-05 | GT2S5 | | ST-4-05 | 68P16 | Filament Bypass |
| C5 | .05 | 200 | CP-503-2 | P288-05 | GT2S5 | | ST-4-05 | 68P16 | AVC Filter |
| C6 | .01 | 150 | CP-103-2 | P288-01 | GT2S1 | GP2-335-01 | ST-4-01 | 68P14 | IF Grid Filter |
| C7 | .05 | 200 | CP-503-2 | P288-05 | GT2S5 | | ST-4-05 | 68P16 | Filament Bypass |
| C8 | 100 | 500 | | 1468-0001 | 5W5T1 | GP1K-100 | MO.5-31 | 1FM-31 | Diode Filter Note 1 |
| C9 | .001 | 200 | | P688-001 | GT6D1 | GP2L-001 | ST-6-001 | 68P1 | Audio Coupling Note 1 |
| C10 | .01 | 200 | | P488-01 | GT2S1 | GP2-335-01 | ST-4-01 | 68P14 | AF Amp. Screen Bypass Note 1 |
| C11 | 100 | 500 | | 1468-0001 | 5W5T1 | GP1K-100 | MO.5-31 | 1FM-31 | AF Amp. Plate Bypass Note 1 |
| C12 | .002 | 200 | | P688-002 | GT6D2 | GP2M-002 | ST-6-002 | 68P2 | Audio Coupling Note 1 |
| C13 | .005 | 400 | CP-502-2 | P688-005 | GT6D5 | GP2M-005 | ST-6-005 | TM-25 | Output Plate Bypass Note 1 |
| C14 | .05 | 600 | CP-503-1 | P688-05 | GT6S5 | | ST-6-05 | TM-15 | Line Filter |
| C15 | .1 | 400 | CF-104-1 | P488-1 | GT4P1 | | ST-4-1 | 72P2 | Line Isolation |

Note 1. Some models combine items C8, C9, C10, C11 and C12 into one unit.

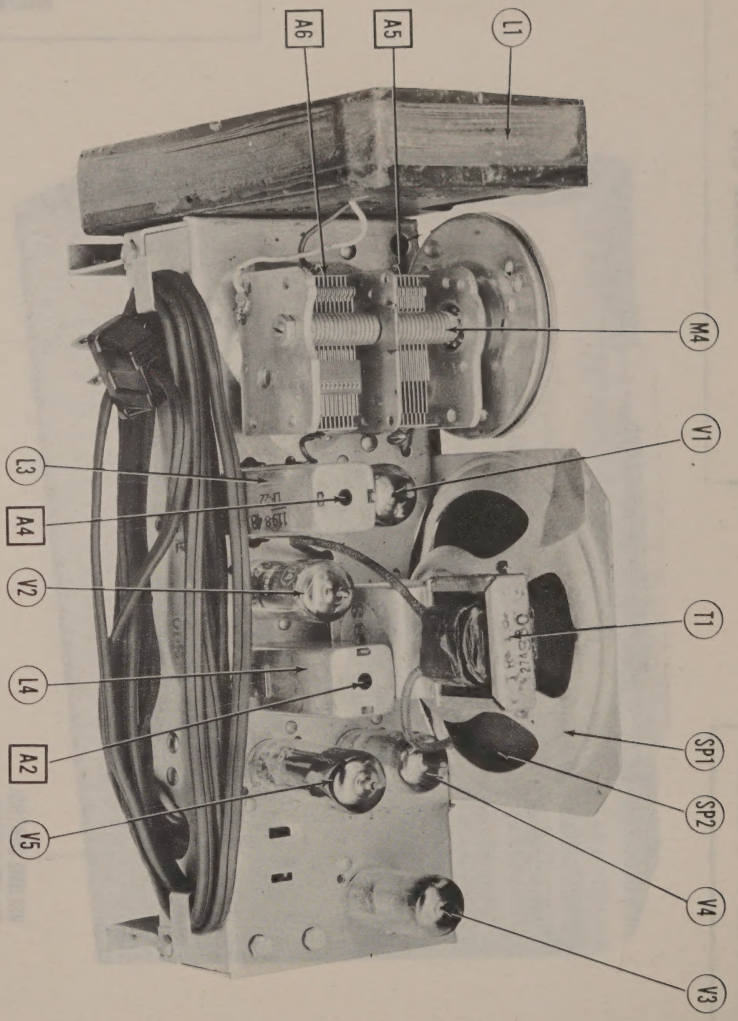
## CONTROLS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: AIRCASTLE PART No. | IRC PART No. | CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| R1A | 1 Meg. | ½ | VC-16 | D13-137 | M-63-Z | Volume control |
| B | Shaft | | Not Req. | A | Not Req. | Attach to R1A Per Instructions |
| C | Switch | | Not Req. | 42 | SW-A2 | " " " " " |

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: AIRCASTLE PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| R2 | 100KΩ | ½ | RC-104-1 | BTS-100K | Osc. Grid |
| R3 | 15KΩ | ½ | RC-153-1 | BTS-15K | Osc. Anode |
| R4 | 10 Meg. | ½ | RC-106-1 | BTS-10 Meg. | IF Grid |
| R5 | 2200Ω | ½ | RC-222-2 | BTS-2200 | IF Filament |
| R6 | 3.3 Meg. | ½ | RC-335-1 | BTS-3.3 Meg. | AVC Network |
| R7 | 10 Meg. | ½ | RC-106-1 | BTS-10 Meg. | AF Grid |
| R8 | 3.3 Meg. | ½ | RC-335-1 | BTS-3.3 Meg. | AF Screen |
| R9 | 1 Meg. | ½ | RC-105-1 | BTS-1 Meg. | AF Plate |
| R10 | 2.2 Meg. | ½ | RC-225-1 | BTS-2.2 Meg. | Output Grid |
| R11 | 680Ω | ½ | RC-681-2 | BTS-680 | Bias Network |
| R12 | 1500Ω | ½ | RC-152-2 | BTS-1500 | Filament String |
| R13 | 390Ω | ½ | RC-391-2 | BW-½-390 | " " |
| R14 | 27Ω | 1 | RC-270-3 | BW-1-27 | " " |
| R15 | 39Ω | ½ | RC-390-2 | BW-½-39 | " " |
| R16 | 2500Ω | 10 | | AB-2500 | Filament Dropping |
| R17 | 6200Ω | 1 | RC-622-5 | BTA-6200 | Filter |
| R18 | 18Ω | ½ | RC-180-1 | | Rectifier Ballast |

## CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | AIRCASTLE PART No. | STANCOR PART No. | THORDAR'N PART No. | MERIT PART No. | |
| | PRI. | SEC. | PRI. | SEC. | | | | | |
| T1 | 6800Ω | 3.5Ω | 360Ω | .4Ω | Part of SP-41-18 | A-3328† | RO-13 † | A-2927 † | † Bend mounting tabs down and mount on original bracket. |

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | | | AIRCASTLE PART No. | JENSEN PART No. | QUAM PART No. | |
| SP1 | FIELD | V. C. IMP. | | ST-113 ‡ | | |
| | PM | 3.5Ω | SP-41-18 | MOD.P4-X | 4A07 ‡ | ‡ Remount Output XFMR. |
| | CONE DIA. | V. C. DIA. | | | | |
| SP2 | 3 7/8" | 9/16" | | | | |

## R F COILS

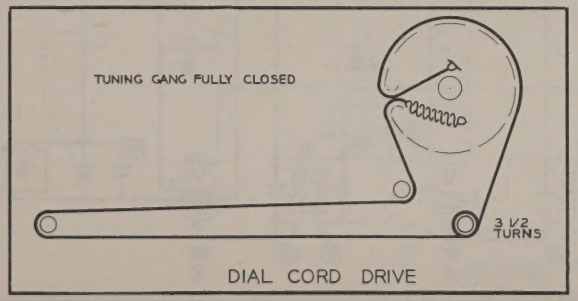
| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | |
|---|---|---|---|---|---|
| | | PRI. | SEC. | AIRCASTLE PART No. | MEISSNER PART No. |
| L1 | Loop Ant. | 3.5Ω | | LP-11 | |
| L2 | Osc. Coil | 1.5Ω | 7Ω | LC-8 | |
| L3 | Input IF | 24Ω | 24Ω | LF-22 | 16-6668 |
| L4 | Output IF | 24Ω | 24Ω | LF-22 | 16-6669 |

## BATTERIES

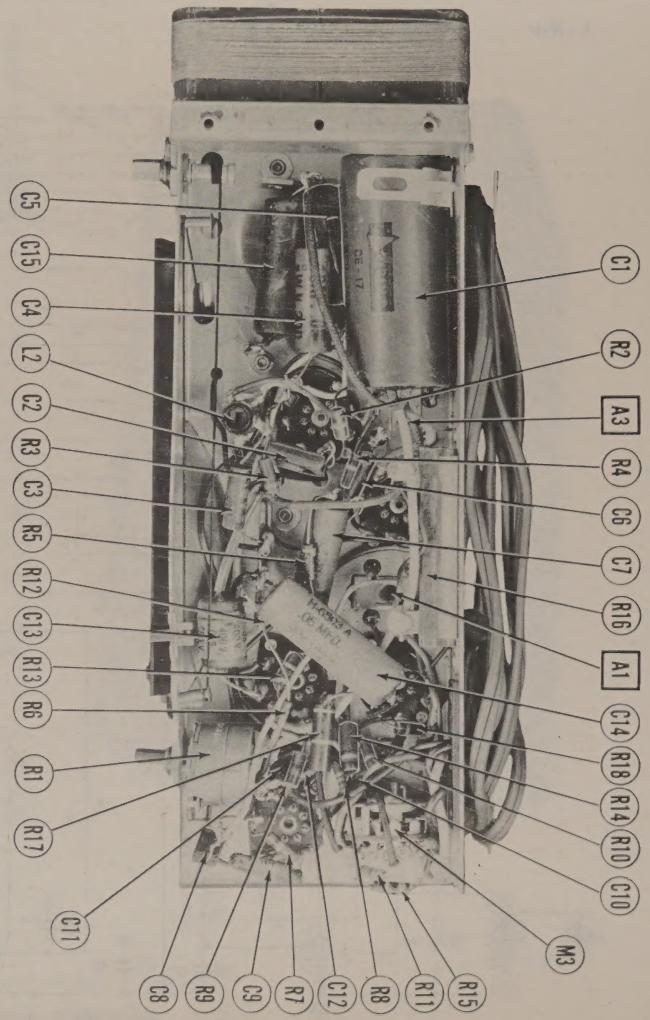
| ITEM No. | VOLTAGE | AIRCASTLE PART No. | REPLACEMENT DATA | | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | | | EVEREADY | | | BURGESS | | | |
| | | | "A" | "B" | "A-B" | "A" | "B" | "A-B" | |
| M1 | 4.5V"A" | 1512 | 746 | | | G3 | | | |
| M2 | 67.5V"B" | 1523 | | 467 | | | XX45 | | |

## MISCELLANEOUS

| ITEM No. | PART NAME | AIRCASTLE PART No. | NOTES |
|---|---|---|---|
| M3 | Switch | SW-11 | AC/DC-Battery |
| M4 | 2 Gang Var. Cap | CV-15 | (28-392MMF, 31-175MMC) |
| | Dial Pointer | PM-16 | |
| | Knob | KN-24 | |
| | Cabinet | CB-113-A | |

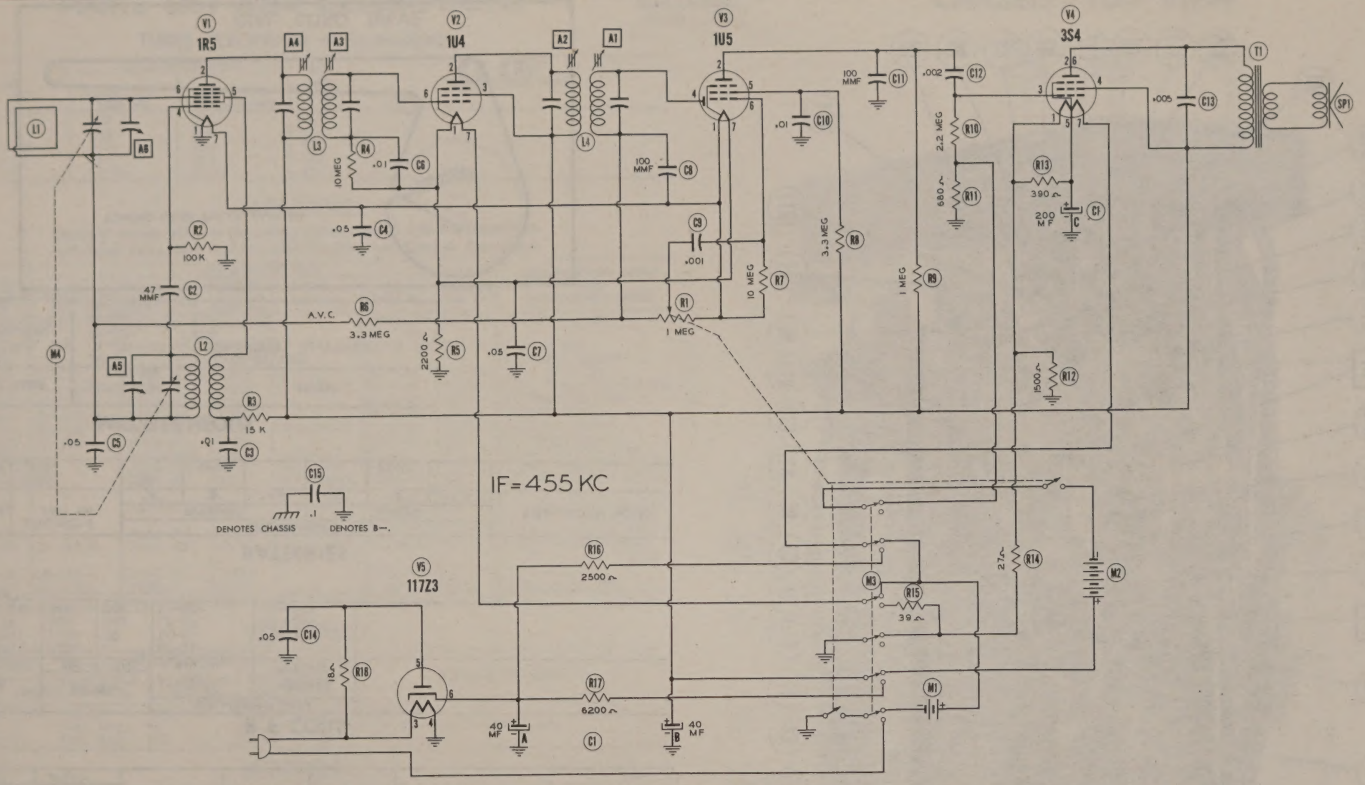



# CHASSIS—BOTTOM VIEW




DATE 6/49 4911-1 SET #63 FOLDER 1

AIRCASTLE MODEL 213




VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 |
|---|---|---|---|---|---|---|---|---|
| 1 | 1R5 | 0V | 70VDC | 46.5VDC | 5-4.1VDC | 1.5VAC | 0V | 1.3VAC |
| 2 | 1U4 | 2.6VAC | 70VDC | 70VDC | 0V | 2.6VAC | 0V | 4VAC |
| 3 | 1U5 | 1.3VAC | 7.2VDC | 14VDC | .2VDC | 0V | 0V | 2.6VAC |
| 4 | 3S4 | 7.4VAC | 70VDC | 0V | 70VDC | 8.8VAC | 70VDC | 10VAC |
| 5 | 117Z3 | 118VAC | 0V | 117VAC | 0V | 118VAC | 125VDC | 0V |

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 |
|---|---|---|---|---|---|---|---|---|
| 1 | 1R5 | ∞ | 16.5KΩ | 122KΩ | 90KΩ | ∞ | 4Meg. | ∞ |
| 2 | 1U4 | ∞ | 16.5KΩ | 16.5KΩ | Inf. | ∞ | 10Meg. | ∞ |
| 3 | 1U5 | ∞ | 11Meg. | 13.3Meg | 16.5KΩ | Inf. | 10Meg. | ∞ |
| 4 | 3S4 | ∞ | 16.5KΩ | 2.5Meg. | 16.5KΩ | ∞ | 16.5KΩ | ∞ |
| 5 | 117Z3 | 19Ω | Inf. | 3Ω | 0Ω | 19Ω | 3KΩ | Inf. |

*DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.
† Measured from pin 6 of V5.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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4911-1

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

AMPLIFIER CORP. OF AMERICA
MODELS ACA-100DC, ACA-100GE

AMPLIFIER CORP. OF AMERICA
MODELS ACA-100DC, ACA-100GE

| | |
|---|---|
| TRADE NAME | Amplifier Corp. of America, Models ACA-100DC, ACA-100GE |
| MANUFACTURER | Amplifier Corp. of America, 396 Broadway, New York 13, New York |
| TYPE SET | AC Operated 2 Channel Audio Amplifier |
| TUBES(TWELVE) | Types 12SC7 Phono Pre-Amp., 12SC7 Phase Inverter, 6SC7 1st AF Amp., 12SK7GT 1st Expander, 12SK7GT 2nd Expander, 6SC7 Expander Rectifier, (2) 6SJ7 Driver, (2) 6L6G Power Output, 5U4G Rectifier, 5V4G Rectifier. |
| POWER SUPPLY | 105-120 Volts AC RATING 1.35 @ 117 Volts AC |

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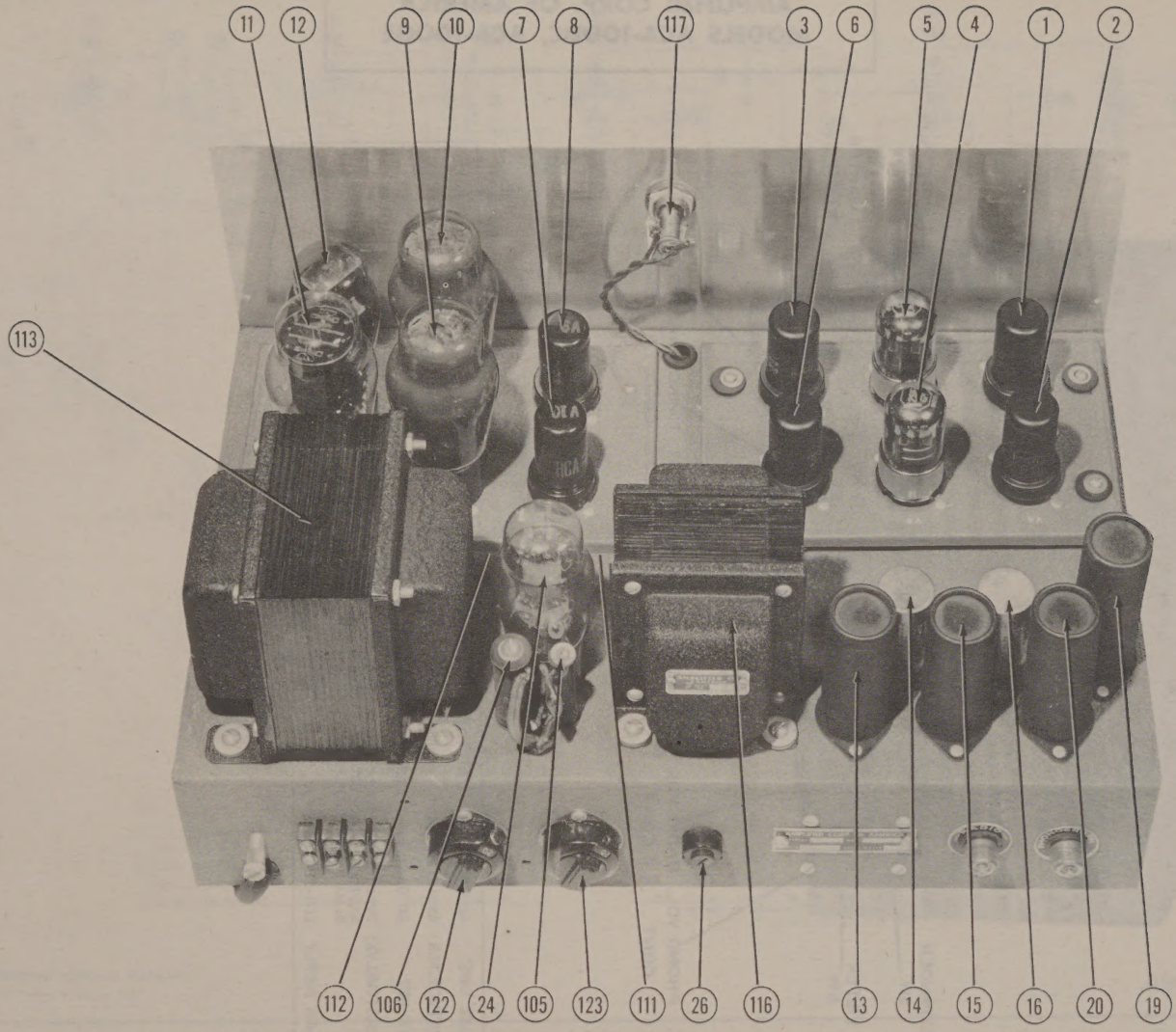
DATE 6/49 4911-2 SET #63 FOLDER 2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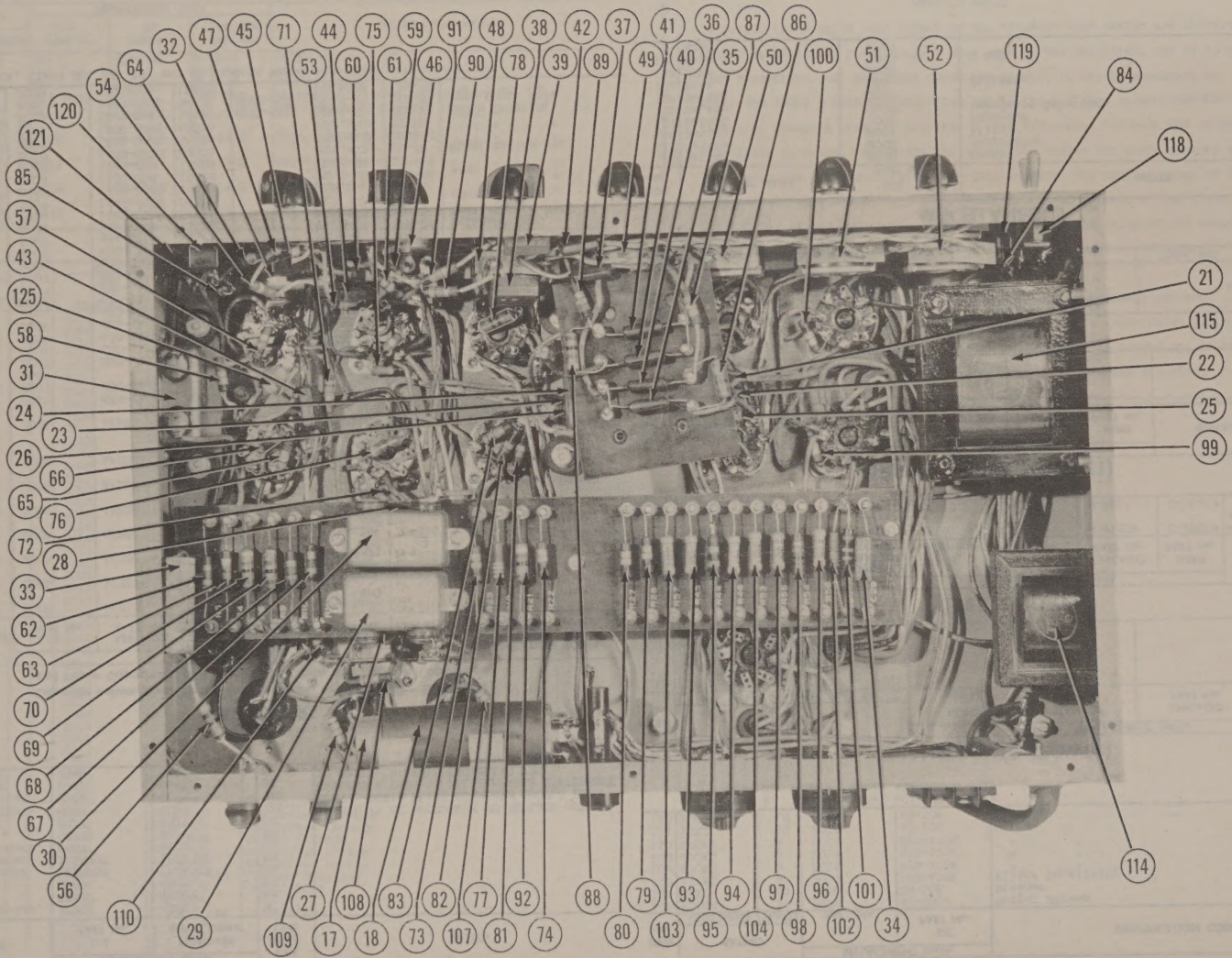
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# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: ACA PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| 1 | Phono Pre-Amp. | 12SC7 | 12SC7 | 8S | |
| 2 | Inverter | 12SC7 | 12SC7 | 8S | |
| 3 | 1st AF | 6SC7 | 6SC7 | 8S | |
| 4 | 1st Expander | 12SK7GT | 12SK7GT | 8N | |
| 5 | 2nd Expander | 12SK7GT | 12SK7GT | 8N | |
| 6 | Expander-Rect. | 6SC7 | 6SC7 | 8S | |
| 7 | Driver | 6SJ7 | 6SJ7 | 8N | |
| 8 | Driver | 6SJ7 | 6SJ7 | 8N | |
| 9 | Power Output | 6L6G | 6L6G | 7AC | SHOULD IT BE NECESSARY TO REPLACE OUTPUT |
| 10 | Power Output | 6L6G | 6L6G | 7AC | TUBES, THEIR PLATE CURRENTS SHOULD BE |
| 11 | Rectifier | 5U4G | 5U4G | 5T | MATCHED WITHIN 10 MILLIAMPERES DIFFERENCE, |
| 12 | Rectifier | 5V4G | 5V4G | 5L | IN ORDER TO AVOID EXCESSIVE HUM. |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: ACA PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| 13 | 20 | 450 | 2005 | AF22J | UP1145 | | DY-2x10-450 | EL-210 | Filter |
| 14 | 20 | 450 | 2005 | AF22J | UP1145 | | DY-2x10-450 | EL-210 | " |
| 15 | 20 | 450 | 2005 | AF22J | UP1145 | | DY-2x10-450 | EL-210 | " |
| 16 | 20 | 450 | 2005 | AF22J | UP1145 | | DY-2x10-450 | EL-210 | " |
| 17A | 10 | 450 | 2008 | AF222J | UP11145 | | DY-3x10-450 | EL-310 | " |
| B | 20 | 450 | | | | | | | " |
| 18 | 20 | 450 | 2005 | AF22J | UP1145 | | DY-2x10-450 | EL-210 | Output Screen Bypass |
| 19A | 10 | 450 | 2008 | AF222J | UP11145 | | DY-3x10-450 | EL-210 | Filter |
| B | 10 | 450 | | | | | | | Decoupling |
| C | 10 | 450 | | | | | | | " |
| 20A | 10 | 450 | 2005 | AF22J | UP1145 | | DY-2x10-450 | EL-210 | " |
| B | 10 | 450 | | | | | | | Cathode Bypass |
| 21 | .1 | 600 | 2007 | 630-.1 | DYR6010 | | XDMR6-.1 | BP-16 | Screen Grid Balance |
| 22A | .1 | 600 | 2007 | 630-2x.1 | DYR6011 | | XDMR6-2x.1 | BP-216 | Bias Filter |
| B | .1 | 600 | 2007 | | | | | | Timing Cap. |
| 23 | .1 | 600 | 2007 | 630-.1 | DYR6010 | | XDMR6-.1 | BP-16 | Audio Coupling |
| 24 | .1 | 600 | 2007 | 630-.1 | DYR6010 | | XDMR6-.1 | BP-16 | " " |
| 25 | .1 | 600 | 2007 | 630-.1 | DYR6010 | | XDMR6-.1 | BP-16 | " " |
| 26 | .1 | 600 | 2007 | 630-.1 | DYR6010 | | XDMR6-.1 | BP-16 | " " |
| 27 | .1 | 600 | 2007 | 630-.1 | DYR6010 | | XDMR6-.1 | BP-16 | " " |
| 28 | .1 | 600 | 2007 | 630-.1 | DYR6010 | | XDMR6-.1 | BP-16 | " " |
| 29 | .1 | 600 | 2007 | 630-.1 | DYR6010 | | XDMR6-.1 | BP-16 | " " |
| 30 | .1 | 600 | 2007 | 630-.1 | DYR6010 | | XDMR6-.1 | BP-16 | " " |
| 31 | .1 | 600 | 2007 | 630-.1 | DYR6010 | | XDMR6-.1 | BP-16 | " " |
| 32 | .1 | 600 | 2007 | 630-.1 | DYR6010 | | XDMR6-.1 | BP-16 | " " Note |
| 33 | .1 | 400 | 2007 | 484-.1 | | | ST-4-1 | TC-1 | " " " |
| 34 | 6000 | 200 | 2009 | 1467-006 | 1D5D6 | | MW.5-26 | 1FM-26 | Balancer Cap. |
| 35 | 500 | 500 | 2010 | 1469-0005 | 5R5T5 | | MOS.5-35 | MS-35 | Equalization Net. |
| 36 | 500 | 500 | 2057 | 1469-0005 | 5R5T5 | | MOS.5-35 | MS-35 | " " |
| 37 | 500 | 500 | 2057 | 1469-0005 | 5R5T5 | | MOS.5-35 | MS-35 | " " |
| 38 | 6000 | 500 | 2009 | 1467-006 | 1D5D6 | | MW.5-26 | 1FM-26 | " " |
| 39 | 6000 | 500 | 2009 | 1467-006 | 1D5D6 | | MW.5-26 | 1FM-26 | " " |
| 40 | 500 | 500 | 2010 | 1469-0005 | 5R5T5 | | MOS.5-35 | MS-35 | Equalization Net. |
| 41 | 500 | 500 | 2057 | 1469-0005 | 5R5T5 | | MOS.5-35 | MS-35 | " " |
| 42 | 500 | 500 | 2057 | 1469-0005 | 5R5T5 | | MOS.5-35 | MS-35 | " " |
| 43 | 1000 | 200 | 2010 | 1467-001 | 1D5D1 | GP2L-001 | MW.5-21 | 1FM-21 | Audio Coupling |
| 44 | 500 | 500 | 2060 | 1468-0005 | 5W5T5 | GP2K-500 | MO.5-35 | 1FM-35 | Tone Comp. Note |
| 45 | 6000 | 500 | 2009 | 1467-006 | 1D5D6 | | MW.5-26 | 1FM-26 | " " " |

Note. Items 32, 33, 44, and 45 used in model ACA-100GE only.

# PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: ACA PART No. | REPLACEMENT DATA: IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| 105 | 8000Ω | 10 | 2026 | AB-8000 | Output Screen |
| 106 | 25KΩ | 20 | 2055 | DG-10K | Bleeder |
| 107 | 470KΩ | ½ | 2014 | BTS-470K | Filter Equalizing |
| 108 | 470KΩ | ½ | 2014 | BTS-470K | " " |
| 109 | 470KΩ | ½ | 2014 | BTS-470K | " " |
| 110 | 470KΩ | ½ | 2014 | BTS-470K | " " |
| 111 | 10KΩ | 10 | 2015 | AB-10K | Filter |
| 112 | 10KΩ | 10 | 2015 | AB-10K | Bleeder |

Note 1. Used on model ACA-100DC only
Note 2. Used on model ACA-100GE only.

## TRANSFORMER (POWER)

| ITEM No. | RATING: PRI. | RATING: SEC. 1 | RATING: SEC. 2 | RATING: SEC. 3 | REPLACEMENT DATA: ACA PART No. | REPLACEMENT DATA: STANCOR PART No. | REPLACEMENT DATA: CHICAGO PART No. | REPLACEMENT DATA: MERIT PART No. |
|---|---|---|---|---|---|---|---|---|
| 113 | 117VAC @ 1.35A | 390VAC .133ADC | 790VAC .100ADC @ 2A | 5.0VAC | | | | |
| | SEC. 4 | SEC. 5 | SEC. 6 | | | | | |
| | 5.0VAC @ 3A | 6.8VAC @ 1.8A | 6.8VAC @ 1.4A | | | | | |

## FILTER CHOKE

| ITEM No. | RATINGS: TOTAL DIRECT CURRENT | RATINGS: D. C. RESISTANCE | RATINGS: INDUCTANCE (0 CURRENT 1000 ~) | REPLACEMENT DATA: ACA PART No. | REPLACEMENT DATA: STANCOR PART No. | REPLACEMENT DATA: CHICAGO PART No. | REPLACEMENT DATA: MERIT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| 114 | .061A | 340Ω | 25 Henry | CH1B | C-1708* | R-8120* | C-2990* | * Drill new mounting holes. |
| 115 | .096A | 100Ω | 8 Henry | CH17C | C-1001* | R-885* | C-2991* | |

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING: IMPEDANCE PRI. | RATING: IMPEDANCE SEC. | RATING: DC RES. PRI. | RATING: DC RES. SEC. | REPLACEMENT DATA: ACA PART No. | REPLACEMENT DATA: STANCOR PART No. | REPLACEMENT DATA: CHICAGO PART No. | REPLACEMENT DATA: MERIT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| 116 | 9KΩ CT | 8ΩCT<br>16ΩCT<br>20ΩCT<br>500ΩCT | 190Ω CT | .5ΩCT<br>.9ΩCT<br>1ΩCT<br>22ΩCT | OT24J | | | | |

## DIAL LIGHTS

| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA: ACA PART No. | REPLACEMENT DATA: | NOTES |
|---|---|---|---|---|---|---|---|
| 117 | Screw | 6-8V | 0.15 | Brown | | | Type #40 |

## MISCELLANEOUS

| ITEM No. | PART NAME | ACA PART No. | NOTES |
|---|---|---|---|
| 118 | Switch | 2002 | Master |
| 119 | Switch | 2003 | Suppressor |
| 120 | Switch | 2001 | Filter |
| 121 | Switch | 2003 | Expander |
| 122 | Switch | 2037 | Impedence Selector |
| 123 | Switch | 2037 | " " |
| 124 | Tube | BBR | Ballast |
| 125 | Bias Cell | 2061 | |
| 126 | Fuse | 2040 | 3 Amp. |
| | Knob | 2047 | |

# PARTS LIST AND DESCRIPTIONS (Continued)

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | ACA PART No. | IRC PART No. | CLAROSTAT PART No. | |
| 46A | 500KΩ | ½ | 2011 | D13-133 | M-60-Z | Radio volume control |
| B | Shaft | | Not Req. | A | Not Req. | Attach to 46A Per Instructions |
| 47A | 500KΩ | ½ | 2011 | D13-133 | M-60-Z | Phono Volume control |
| B | Shaft | | Not Req. | A | Not Req. | Attach to 47A Per Instructions |
| 48A | 500KΩ | ½ | 2018 | 33-3333 | DC-10-Z | Low Frequency control Dual |
| B | 500KΩ | ½ | | | | " " " |
| 49A | 500KΩ | ½ | 2018 | 33-3333 | DC-10-Z | High Frequency control Dual |
| B | 500KΩ | ½ | | | | " " " |
| 50A | 500KΩ | ½ | 2018 | 33-3333 | DC-10-Z | Expressor control Dual |
| B | 500KΩ | ½ | | | | " " " |
| 51A | 500KΩ | ½ | 2018 | 33-3333 | DC-10-Z | Timing control Dual |
| B | 500KΩ | ½ | | | | " " " |
| 52A | 500KΩ | ½ | 2018 | 33-3333 | DC-10-Z | Master gain control Dual |
| B | 500KΩ | ½ | | | | " " " |

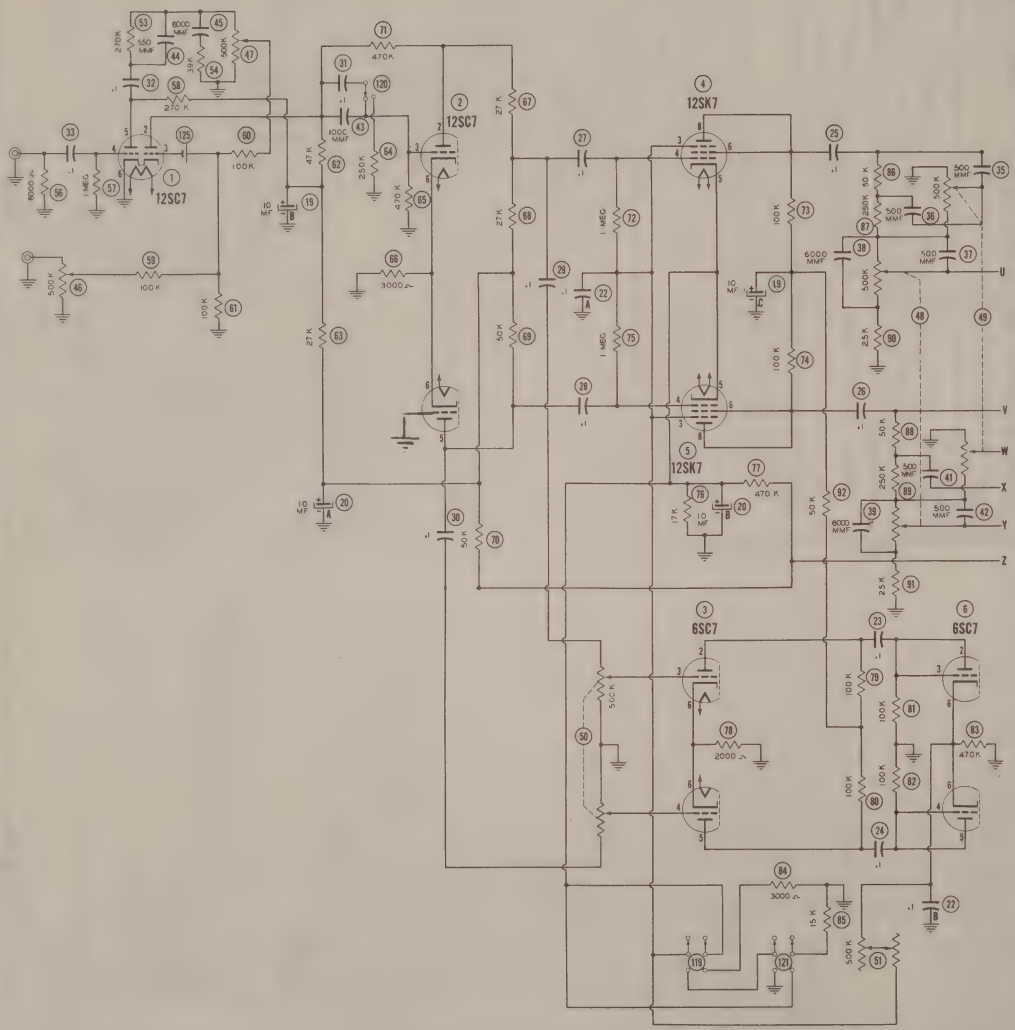
## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | ACA PART No. | IRC PART No. | |
| 53 | 270KΩ | ½ | 2021 | BTS-270K | Tone Comp. |
| 54 | 39KΩ | ½ | 2059 | BTS-39K | " " |
| 55 | 2700Ω | ½ | 2012 | BTS-2700 | Pre-Amp. Cathode Note 1 |
| 56 | 8200Ω | ½ | 2058 | BTS-8200 | Phono Shunt Note 2 |
| 57 | 1 Meg. | ½ | 2016 | BTS-1 Meg. | 1st Pre-Amp. Grid Note 2 |
| 58 | 270KΩ | ½ | 2021 | BTS-270K | 1st Pre-Amp. Plate Load Note 2 |
| 59 | 100KΩ | ½ | 2020 | BTS-100K | Isolation " " " |
| 60 | 100KΩ | ½ | 2020 | BTS-100K | " " " |
| 61 | 100KΩ | ½ | 2020 | BTS-100K | 2nd Pre-Amp. Grid Note 2 |
| 62 | 47KΩ | ½ | 2014 | BTS-47K | 2nd Pre-Amp. Plate Load |
| 63 | 27KΩ | ½ | 2013 | BTS-27K | 2nd Pre-Amp. Plate Decoupling |
| 64 | 250KΩ | ½ | 2021 | BTS-250K | Series Dialogue Filter |
| 65 | 470KΩ | ½ | 2056 | BTS-470K | Inverter Grid |
| 66 | 3300Ω | ½ | 2012 | BTS-3300 | Inverter Cathode |
| 67 | 27KΩ | ½ | 2013 | BTS-27K | Inverter Plate Load |
| 68 | 27KΩ | ½ | 2013 | BTS-27K | " " " |
| 69 | 50KΩ | ½ | 2014 | BTS-47K | " " " |
| 70 | 50KΩ | ½ | 2014 | BTS-47K | Decoupling |
| 71 | 470KΩ | ½ | 2056 | BTS-470K | Feedback |
| 72 | 1 Meg. | ½ | 2016 | BTS-1 Meg. | 1st Expander Grid |
| 73 | 100KΩ | ½ | 2020 | BTS-100K | 1st Expander Plate Load |
| 74 | 100KΩ | ½ | 2020 | BTS-100K | 2nd Expander Plate Load |
| 75 | 1 Meg. | ½ | 2016 | BTS-1 Meg. | 2nd Expander Grid |
| 76 | 17KΩ | ½ | 2017 | BTS-18K | Expander Cathode |
| 77 | 470KΩ | ½ | 2014 | BTS-470K | Bias |
| 78 | 2000Ω | ½ | 2019 | BTS-1800 | AF Cathode |
| 79 | 100KΩ | ½ | 2020 | BTS-100K | 1st AF Plate Load |
| 80 | 100KΩ | ½ | 2020 | BTS-100K | 2nd AF Plate Load |
| 81 | 100KΩ | ½ | 2020 | BTS-100K | Exp.-Rect. Plate Load |
| 82 | 100KΩ | ½ | 2020 | BTS-100K | Exp.-Rect. Plate Load |
| 83 | 470KΩ | ½ | 2014 | BTS-470K | Exp.-Rect. Cathode |
| 84 | 3000Ω | ½ | 2012 | BTS-2700 | Scratch Suppressor |
| 85 | 15KΩ | ½ | 2022 | BTS-15K | Expressor |
| 86 | 50KΩ | ½ | 2014 | BTS-47K | Equalization Net. |
| 87 | 250KΩ | ½ | 2021 | BTS-270K | " " |
| 88 | 50KΩ | ½ | 2014 | BTS-47K | " " |
| 89 | 250KΩ | ½ | 2021 | BTS-470K | " " |
| 90 | 25KΩ | ½ | 2055 | BTS-22K | " " |
| 91 | 25KΩ | ½ | 2055 | BTS-22K | " " |
| 92 | 50KΩ | ½ | 2014 | BTS-47K | Decoupling |
| 93 | 250Ω | ½ | 2024 | BW-½-220 | 1st Driver Cathode |
| 94 | 250Ω | ½ | 2024 | BW-½-220 | 2nd Driver Cathode |
| 95 | 1800Ω | ½ | 2023 | BTS-1800 | Driver Cathode |
| 96 | 500KΩ | ½ | 2056 | BTS-470K | 1st Driver Screen |
| 97 | 500KΩ | ½ | 2056 | BTS-470K | 2nd Driver Screen |
| 98 | 2 Meg. | ½ | 2025 | BTS-2.2 Meg. | Voltage Dropping |
| 99 | 100KΩ | ½ | 2020 | BTS-100K | Output Grid |
| 100 | 100KΩ | ½ | 2020 | BTS-100K | " " |
| 101 | 5.1 Meg. | ½ | 2027 | BTS-4.7 Meg. | Decoupling |
| 102 | 500KΩ | ½ | 2056 | BTS-470K | " |
| 103 | 100KΩ | ½ | 2020 | BTS-100K | Feedback |
| 104 | 100KΩ | ½ | 2020 | BTS-100K | " |

SERVICE NOTES

If output tubes which read normal on any reliable tube tester are characterized by excessive plate current when used in the amplifier, and if it has been determined that the input tubes are normal, it may be necessary to alter the 500KΩ ½ watt resister item 102 or the 5.1 Meg. ½ watt resistor item 101. Changing item 101 provides a fine adjustment for both the output tube plate currents. Increasing the value will reduce the plate current and decreasing the value will raise the plate current. The nominal range of this resistor varies between 5 and 10 megohms. Course adjustment of the plate current may be had by varying item 102. Increasing the value of the resistance decreases the plate current,and conversely, decreasing the resistance, increases the plate current.

Hum level will be at a minimum when output tubes are properly matched. Distortion will be at a minimum when output tubes draw their rated plate currents. If hum increases as the master gain control is turned up, it may be introduced by defective tubes in the expander or pre-amp circuits.

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EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

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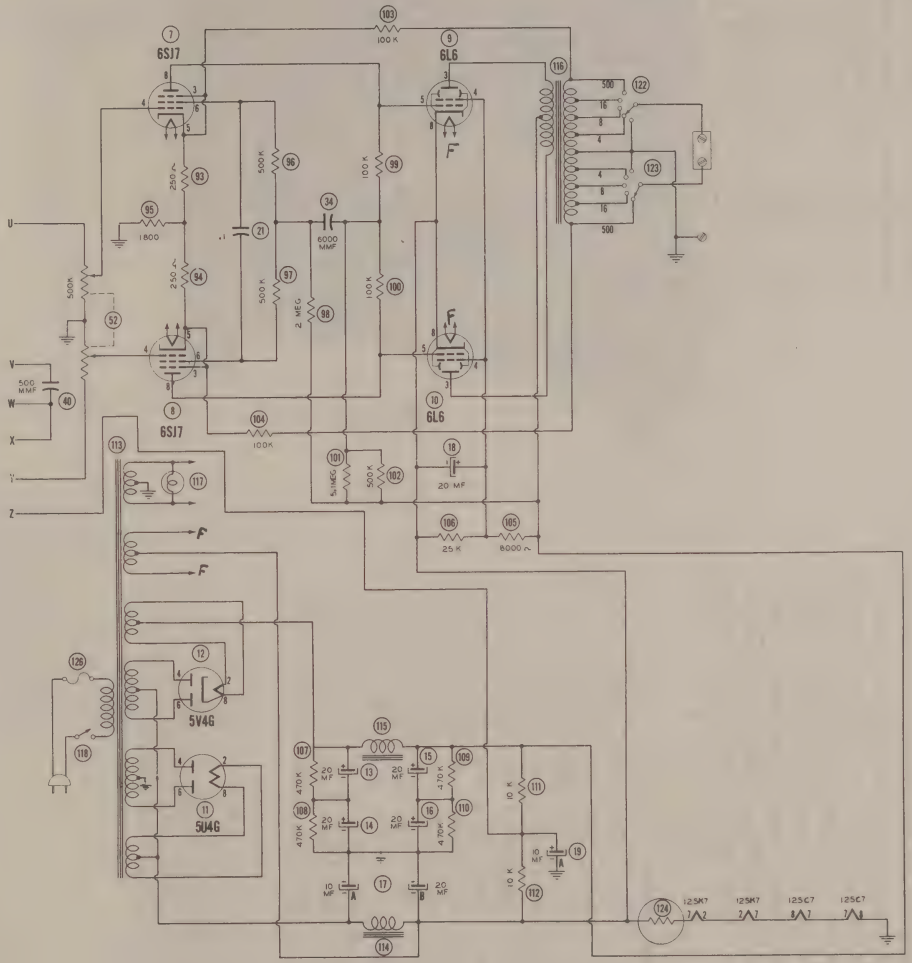


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## VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 12SC7 | 0V | [illegible] | -.1VDC | -.1VDC | [illegible] | 0V | VDC | 0V |
| 2 | 12SC7 | 0V | [illegible] | 0V | 0V | [illegible] | 6.3VAC | VDC | 1.7VDC |
| 3 | [illegible] | 0V | [illegible] | 0V | 0V | [illegible] | 6.3VAC | 6.3VAC | 6.3VAC |
| 4 | 12SK7GT | 0V | 25VDC | .2VDC | .1VDC | 38VDC | 220VDC | 34VDC | 220VDC |
| 5 | 12SK7GT | 0V | [illegible] | .1VDC | .1VDC | 3.5VDC | 90VDC | 1.7VDC | 80VDC |
| 6 | 6SC7 | 0V | 0V | 0V | 0V | 0V | .6VDC | 6.3VAC | 6.3VAC |
| 7 | 6SJ7 | 0V | 3.3VAC | 1.5VDC | 0V | 1.5VDC | 35VDC | 3.3VAC | 135VDC |
| 8 | 6SJ7 | 0V | 3.3VAC | 1.4VDC | 0V | 1.5VDC | 34VDC | 3.3VAC | 135VDC |
| 9 | 6L6G | 0V | 180VDC | 650VDC | 520VDC | 135VDC | 180VDC | 180VDC | 180VDC |
| 10 | 6L6G | 0V | 180VDC | 650VDC | 520VDC | 135VDC | 180VDC | 180VDC | 180VDC |
| 11 | 5U4G | 0V | 190VDC | 650VDC | 190VAC | 0V | 190VAC | 190VDC | 190VDC |
| 12 | 5U4G | 0V | 680VDC | 0V | 420VAC | 0V | 420VAC | 0V | 0VDC |

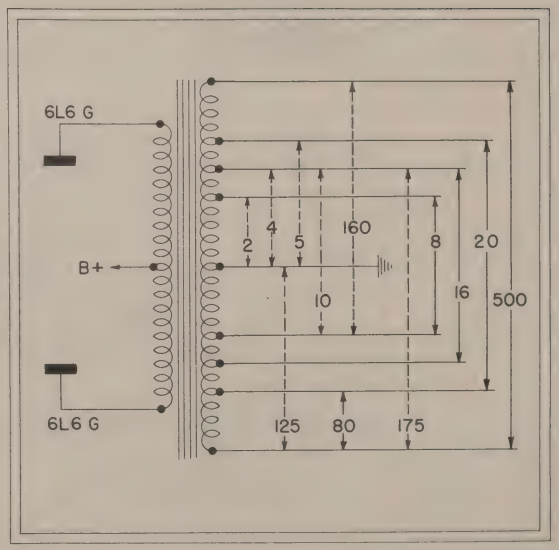
## RESISTANCE READINGS

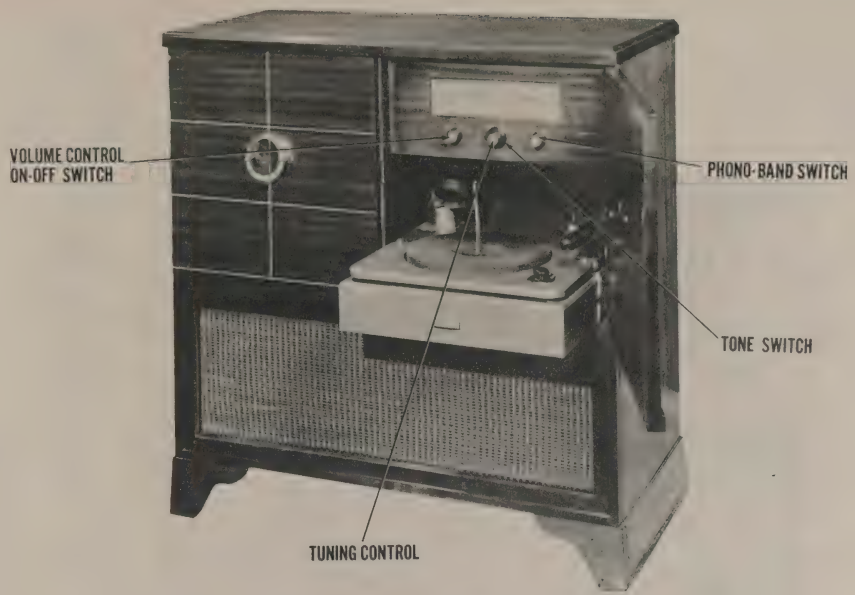
| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 12SC7 | 0Ω | *110K | 480KΩ | 1 Meg. | *300KΩ | 0Ω | 17Ω | 0Ω |
| 2 | 12SC7 | 0Ω | *100KΩ | 480KΩ | 0Ω | *100KΩ | 3KΩ | 17Ω | 30Ω |
| 3 | 6SC7 | 0Ω | *100KΩ | 470KΩ | 470KΩ | *100KΩ | 2KΩ | .2Ω | .2Ω |
| 4 | 12SK7GT | 0Ω | 40Ω | 500K | 1.5Meg. | 10KΩ | *150KΩ | 50Ω | *150KΩ |
| 5 | 12SK7GT | 0Ω | 40Ω | 500KΩ | 1.5Meg. | 15KΩ | *150KΩ | 30Ω | *150KΩ |
| 6 | 6SC7 | 0Ω | *110KΩ | 100KΩ | 100KΩ | *110KΩ | 470KΩ | .2Ω | .2Ω |
| 7 | 6SJ7 | 0Ω | .2Ω | 1300Ω | 100KΩ | 1300Ω | *2.5Meg. | .2Ω | *600KΩ |
| 8 | 6SJ7 | 0Ω | .2Ω | 1300Ω | 160KΩ | 1300Ω | *2.5Meg. | .2Ω | *600KΩ |
| 9 | 6L6G | 0Ω | 1100Ω | *210Ω | *8KΩ | 600KΩ | 500KΩ | 1100Ω | 1200Ω |
| 10 | 6L6G | 0Ω | 1100Ω | *210Ω | *8KΩ | 600KΩ | 500KΩ | 1100Ω | 1200Ω |
| 11 | 5U4G | Inf. | 1600Ω | 13KΩ | 35Ω | Inf. | 35Ω | 1500Ω | 1600Ω |
| 12 | 5U4G | Inf. | 13KΩ | Inf. | 1500 | Inf. | 1500Ω | Inf. | 13KΩ |

* Measured from pin 8 of 5U4G

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

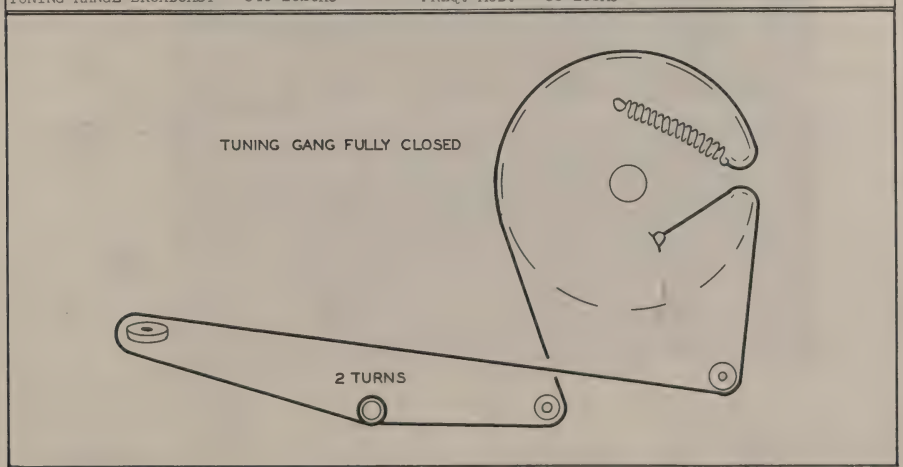
| [illegible] IMPEDANCE (OHMS) | SWITCH SETTING | |
|---|---|---|
| | 122 | 123 |
| 2 | 0 | 8 |
| 4 | 0 | 16 |
| 5 | 0 | 20 |
| 8 | 8 | 8 |
| 10 | 8 | 16 |
| 16 | 16 | 16 |
| 20 | 20 | 20 |
| 125 | 0 | 500 |
| 160 | 8 | 500 |
| 175 | 16 | 500 |
| 500 | 500 | 500 |






BENDIX MODEL 69M9

| | |
|---|---|
| TRADE NAME | Bendix, Models 69B8, 68M8, 69M9 |
| MANUFACTURER | Bendix Radio, Div. Of Bendix Aviation Corp., Baltimore, Maryland |
| TYPE SET | AC Operated Combination Phono-Radio, AM-FM Superheterodyne Receiver with Loop Antenna |
| TUBES(SIX) | Types 12BA6 RF Amp., 12AT7 Converter, 12BA6 1st IF Amp., 12BA6 2nd IF Amp., 19T8 DET-AVC-AF, 50L6GT Power Output |
| POWER SUPPLY | 105-120 Volts — RATING .35 Amp. @ 117 Volts AC |
| TUNING RANGE-BROADCAST | 540-1620KC — FREQ. MOD. 88-108MC |




DIAL CORD DRIVE

BENDIX MODELS
69B8, 69M8, 69M9

BENDIX MODELS
69B8, 69M8, 69M9

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

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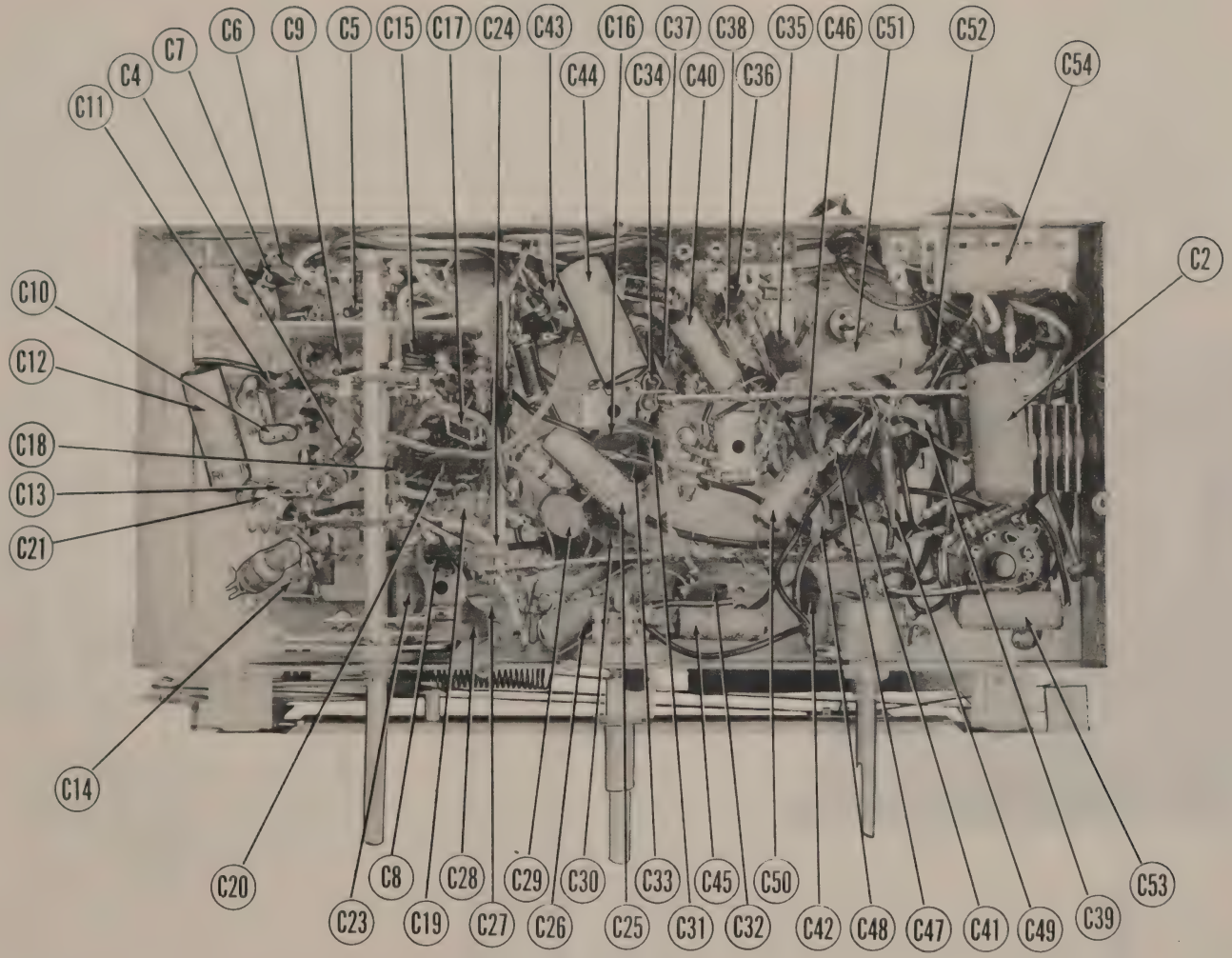
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R29
R30
R32
R31
R25
R26
L17
R1
C
R19
R27
L18
R14
M4
R28
L14
R10
R9
L16
A9
M3
L3
R4
L5
R7
L6
L7
L8
R8

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: BENDIX PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| V1 | RF Amp. | 12BA6 | 12BA6 | 7BK | |
| V2 | Converter | 12AT7 | 12AT7 | 7BC | |
| V3 | 1st IF Amp. | 12BA6 | 12BA6 | 7BK | |
| V4 | 2nd IF Amp. | 12BA6 | 12BA6 | 7BK | |
| V5 | DET.-AVC-AF | 19T8 | 19T8 | | |
| V6 | Power Output | 50L6GT | 50L6GT | 7AC | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: BENDIX PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | 50 | 150 | CE4A03 | AF886D4A* | UP7DJ63 | | DY-419* | D14560 | ◓ Filter |
| B | 40 | 150 | | PRS2571 | | | M-25-25 | | ■ Filter |
| C | 30 | 150 | | | | | | | ▲ Filter |
| D | 50 | 25 | | | | | | | Output Cath. Bypass |
| C2 | 5 | 50 | CE1T06 | PRS150/4 | BR550 | | M-4-150 | TVA-13 | Stabilizing Cap. |
| C3 | 4.7 | | CC0A18 | 1468-000005 | 5W5V5 | NP0K-5 | M0.5-55 | MS-55 | Ext. Ant. Coupling |
| C4 | 470 | | CC9M42 | 1468-0005 | 5W5T5 | GP2K-500 | M0.5-35 | 1FM-35 | RF Coupling |
| C5 | 820 | | CC9A68 | 1468-0002 | 5W5T2 | GP2K-200 | M0.5-32 | 1FM-32 | " " |
| C6 | 100 | 500 | CC9A34 | 1468-0001 | 5W5T1 | GP1K-100 | M0.5-31 | 1FM-31 | Ant. Isolation |
| C7 | 1000 | | CC9M50 | 1468-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | RF Bypass |
| C8 | 10000 | | CC9R80 | P488-01 | GT4S1 | GP2-335-01 | ST-4-01 | TM-11 | " " |
| C9 | 22 | | CC0A26 | 1468-000025 | 5W5Q2 | GP1K-25 | M0.5-425 | MS-42 | RF Coupling |
| C10 | 1000 | | CC9M50 | 1468-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | " " |
| C11 | 1000 | | CC9M50 | 1468-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | RF Bypass |
| C12 | .05 | 400 | CP4T40 | P488-05 | GT4S5 | | ST-4-05 | TM-15 | " " |
| C13 | 1000 | | CC9M50 | 1468-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | " " |
| C14 | 1000 | | CC9M50 | 1468-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | " " |
| C15 | 5000 | | CC0M00 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | RF Fil. Bypass |
| C16 | 5000 | | CC0M00 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | " " " |
| C17 | 1000 | 500 | CC9M50 | 1468-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | Conv. Cath. Bypass |
| C18 | 4.7 | | CC0A18 | 1469-000005 | 5R5V5 | NP0K-5 | M0S.5-55 | MS-55 | Fixed Trimmer |
| C19 | 47 | | CC8B20 | 1468-00005 | 5W5Q5 | GP1K-50 | M0.5-45 | 1FM-45 | Osc. Grid Cap. |
| C20 | 5000 | | CC0M00 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | Osc. Plate Bypass |
| C21 | 10 | | CC8B22 | 1469-00001 | 5R5Q1 | NP0K-10 | M0S.5-41 | MS-41 | Fixed Trimmer |
| C22 | 2.2 | | CC0A14 | | | NP0K-3 | | | Osc. Coupling |
| C23 | 5000 | | CC0M00 | 1467-005 | 1D5D5 | GP2M- 005 | MW.5-25 | 1FM-25 | Conv. Plate Decoup. |
| C24 | 470 | | CC9M42 | 1468-0005 | 5W5T5 | GP2K- 500 | M0.5-35 | 1FM-35 | IF Coupling |
| C25 | .03 | 400 | CP4T36 | P488-03 | GT4S3 | | ST-6-03 | TM-13 | AVC Filter |
| C26 | .03 | 400 | CP4T36 | P488-03 | GT4S3 | | ST-6-03 | TM-13 | " " |
| C27 | 10000 | | CC9R80 | P488-01 | GT4S1 | GP2-335-01 | ST-4-01 | TM-11 | RF Bypass |
| C28 | 5000 | | CC0M00 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | AVC Filter |
| C29 | 5000 | | CC0M00 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | 1st IF Fil. Bypass |
| C30 | 5000 | | CC0M00 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | 1st IF Screen Bypass |
| C31 | 5000 | | CC0M00 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | 1st IF Plate Decoup. |
| C32 | 10000 | | CC9R80 | P488-01 | GT4S1 | GP2-335-01 | ST-4-01 | TM-11 | RF Bypass |
| C33 | 10000 | | CC9R80 | P488-01 | GT4S1 | GP2-335-01 | ST-4-01 | TM-11 | RF Bypass |
| C34 | 470 | | CC9M42 | 1468-0005 | 5W5T5 | GP2K-500 | M0.5-35 | 1FM-35 | IF Coupling |
| C35 | 5000 | | CC0M00 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | 2nd IF Decoupling |
| C36 | 5000 | | CC0M00 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | 2nd IF Fil. Bypass |
| C37 | 10000 | | CC9R80 | P488-01 | GT4S1 | GP2-335-01 | ST-4-01 | TM-11 | RF Bypass |
| C38 | 100 | | CC9A34 | 1468-0001 | 5W5T1 | GP1K-100 | M0.5-31 | 1FM-31 | Diode Load Cap. |
| C39 | 1000 | | CC9M50 | 1468-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | RF Bypass |
| C40 | .002 | 600 | CP6T12 | P688-002 | GT6D2 | GP2M-002 | ST-6-002 | TM-22 | De-emphasis |
| C41 | 5000 | | CC0M00 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | Fil. Bypass |
| C42 | 5000 | | CC0M00 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | Audio Coupling |
| C43 | 1000 | | CC9M50 | 1468-001 | 1W5D5 | GP2L-001 | MW.5-21 | 1FM-21 | Tone Comp. |
| C44 | .1 | 400 | CP4TS1 | P488-1 | GT4P1 | | ST-4-1 | TM-1 | " " |
| C45 | .002 | 600 | CP6T12 | P688-002 | GT6D2 | GP2M-002 | ST-6-002 | TM-22 | " " |
| C46 | 10000 | | CC9R80 | P488-01 | GT4S1 | GP2-335-01 | ST-6-01 | TM-11 | RF Bypass |
| C47 | 100 | | CC9A34 | 1468-0001 | 5W5T1 | GP1K-100 | M0.5-31 | 1FM-31 | " " |
| C48 | 10000 | | CC9R80 | P488-01 | GT4S1 | GP2-335-01 | ST-4-01 | TM-11 | Audio Coupling |
| C48A | 820 | | Note | 1468-0002 | 5W5T2 | GP2K-200 | M0.5-32 | 1FM-32 | AF Plate Bypass |
| B | 5000 | | | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | Audio Coupling |
| C50 | .004 | 600 | CP6T16 | P688-004 | GT6D4 | | ST-6-004 | TM-24 | Tone Comp. |
| C51 | .03 | 400 | CP4T36 | P488-03 | GT4S3 | | ST-6-03 | TM-13 | RF Bypass |

# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING: IMPEDANCE PRI. | RATING: IMPEDANCE SEC. | RATING: DC RES. PRI. | RATING: DC RES. SEC. | REPLACEMENT DATA: BENDIX PART No. | REPLACEMENT DATA: STANCOR PART No. | REPLACEMENT DATA: CHICAGO PART No. | REPLACEMENT DATA: MERIT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| T1 | 2200Ω | 5.7Ω | 230Ω | 1.7Ω | TA0020 | A-3876 | PO-2 | A-2023 | |

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA: BENDIX PART No. | REPLACEMENT DATA: JENSEN PART No. | REPLACEMENT DATA: QUAM PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| SP1 | FIELD PM | V. C. IMP. 3.7Ω | SPOR01 | ST-11S M.D.T10-T‡ | 10A31 | ‡ Replace output transformer to match 6-8Ω voice coil. |
| SP2 | CONE DIA. 9 3/16" | V. C. DIA. 3/4" | | | | |

## FILTER CHOKE

| ITEM No. | RATINGS: TOTAL DIRECT CURRENT | RATINGS: D.C. RESISTANCE | RATINGS: INDUCTANCE (0 CURRENT 1000 ~) | REPLACEMENT DATA: BENDIX PART No. | REPLACEMENT DATA: STANCOR PART No. | REPLACEMENT DATA: CHICAGO PART No. | REPLACEMENT DATA: MERIT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| L1 | .074A | 86Ω | 2 Henry | LFC102 | | | | |

## R F COILS

| ITEM No. | USE | DC RES. PRI. | DC RES. SEC. | REPLACEMENT DATA: BENDIX PART No. | REPLACEMENT DATA: MEISSNER PART No. | |
|---|---|---|---|---|---|---|
| L2 | AM Loop Ant. | 1.5Ω | | ALOZ15 | | |
| L3 | FM Ant. | 0Ω | | LA0F01 | | |
| L4 | RF Plate Chk. | 0Ω | | LF0A08 | | |
| L5 | FM RF Coil | 0Ω | | LI0F01 | | |
| L6 | RF Choke | 0Ω | | LF0A08 | | |
| L7 | FM Osc. | 0Ω | | LO7F00 | | |
| L8 | AM Osc.Coil | 1.5Ω | 5.5Ω | LO7B01 | 14-1060 | |
| L9A | FM 1st IF | .8Ω | | TI0C12 | | |
| B | AM 1st IF | 0Ω | | | | |
| L10A | FM 2nd IF | 1Ω | | TI0D20 | | |
| B | AM 2nd IF | 13Ω | | | | |
| L11 | Ratio Det. | 1.2Ω | .1Ω | TR0R00 | | |
| L12 | AM 3rd IF | 9Ω | 9Ω | TI0D23 | | |
| L13 | Fil. Choke | 0Ω | | LP0C00 | | |
| L14 | Fil. Choke | 0Ω | | LF0A08 | | |
| L15 | Fil. Choke | 0Ω | | LF0A08 | | |
| L16 | Fil. Choke | 0Ω | | LF0C00 | | |
| L17 | Fil. Choke | 0Ω | | LF0A08 | | |
| L18 | RF Choke | 20Ω | | LF0A07 | | |
| L19 | RF Choke | | | LF0C00 | | Not used in all models |

## DIAL LIGHTS

| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA: BENDIX PART No. | REPLACEMENT DATA: | NOTES |
|---|---|---|---|---|---|---|---|
| M1 | Screw | 110V | | | C7 | | 110V Lamp |

## PHONO CARTRIDGE

| ITEM No. | REPLACEMENT DATA: BENDIX PART No. | REPLACEMENT DATA: ASTATIC PART No. | REMARKS |
|---|---|---|---|
| M2 | | LT1-M | Model 69M9 |

## MISCELLANEOUS

| ITEM No. | PART NAME | BENDIX PART No. | NOTES |
|---|---|---|---|
| M3 | Switch | SR3F00 | Band |
| M4 | Switch | SS1C02 | Tone |
| M5 | Rectifier | QR0S01 | Selenium |
| M6 | 2 Gang Var. Cap. | CV0D01 | (27-535MMF, 32-212MMF) |
| | Dial Pointer | ID0M21 | |
| | Dial Scale | OS0615 | |
| | Cabinet | ZW6G05 | Models 69M8, 69M9 |
| | Cabinet | ZW6G6 | Model 69B8 |

# PARTS LIST AND DESCRIPTIONS (Continued)

| ITEM No. | RATING CAP. | RATING VOLT | REPLACEMENT DATA BENDIX PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C82 | 10000 | | CC9R80 | P488-01 | GT4S1 | GP2-335-01 | ST-4-01 | TM-11 | RF Bypass |
| C83 | .02 | 400 | CP4T34 | P488-02 | GT4S2 | | ST-4-02 | TM-12 | Output Plate Bypass |
| C84 | .05 | 400 | CP4T40 | P488-05 | GT4S5 | | ST-4-05 | TM-15 | Line Filter |
| C85 | .05 | 400 | CP4T40 | P488-05 | GT4S5 | | ST-4-05 | TM-15 | Changer Isolation Note 1 |
| C86 | 5000 | 500 | CC9M50 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | RF Bypass Note 2 |
| C87 | 5000 | 500 | CC0M00 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | IF Cath. Bypass Note 2 |
| C88 | 5000 | 500 | CC0M00 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | Filament Bypass Note 2 |
| C89 | 4.7 | 500 | CC0A18 | 1469-000005 | 5R5V5 | NP0K-5 | MOS.5-55 | MS-55 | Neutralizing Note 2 |

* Parallel sections to obtain desired capacity.
Note. Item C49A, C49B, R30A and R30B are combined into one unit obtainable under MFGRS Pt. ACOC01.
Note 1. Used in models 69M8, 69B8 chassis series A, B, C and model 69M9 chassis A, B, C, and D.
Note 2. Used in models 69M8, 69B8 chassis series B and model 69M9 chassis series B and C.

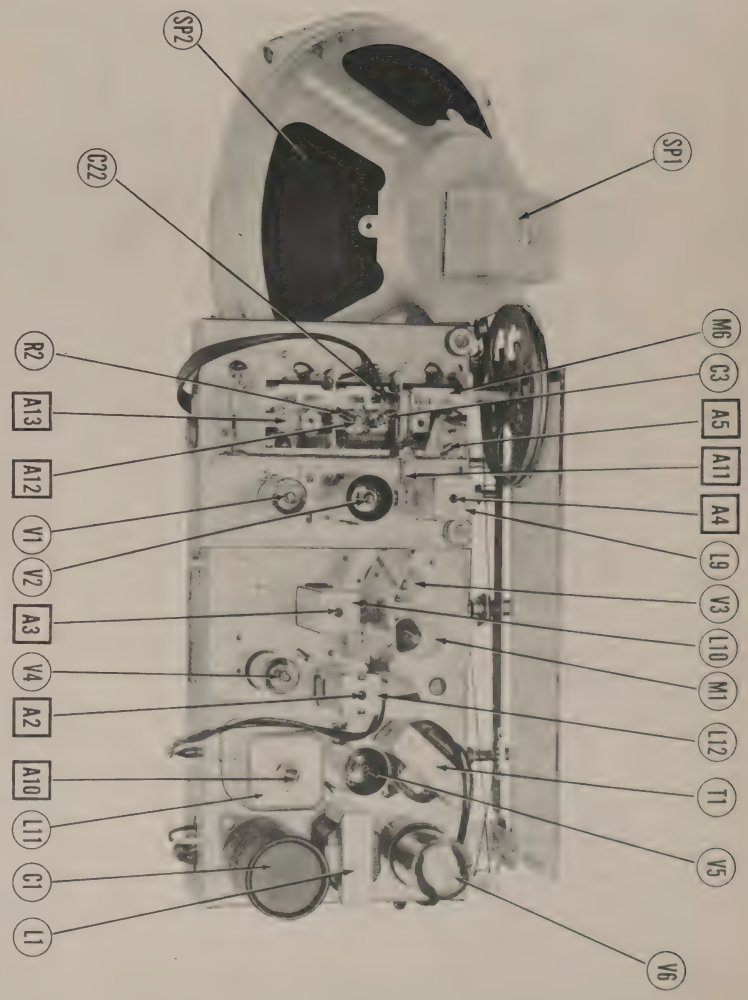
## CONTROLS

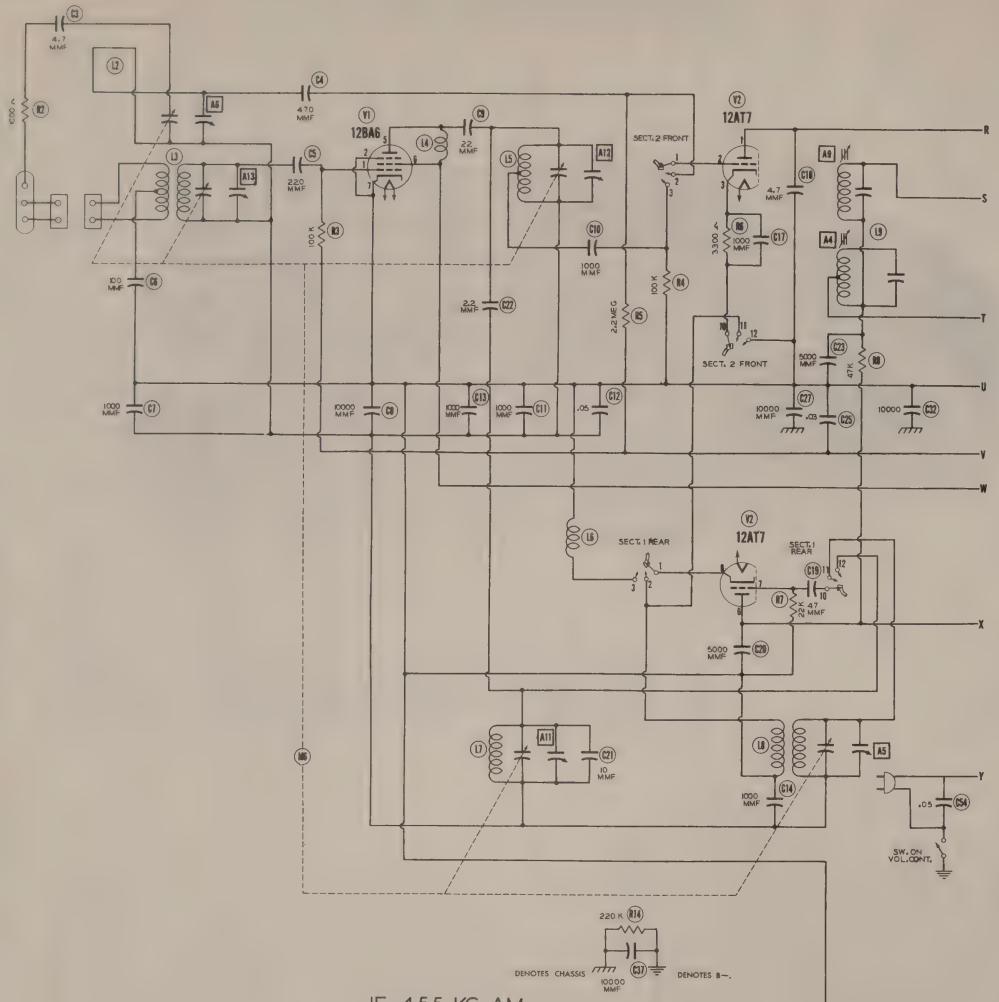
| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA BENDIX PART No. | IRC PART No. | CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| R1A | 1 Meg. | ½ | RV4S13 | D18-139X | T-116 | Volume control tapped @ 1 Meg. |
| B | Shaft | | Not Req. | A | Not Req. | Attach to R1A Per Instructions |
| C | Switch | | Not Req. | 41 | SW-A | " " " " |

## RESISTORS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA BENDIX PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| R2 | 1000Ω | ½ | RC23A102M | BTS-1000 | Ext. Ant. Loading |
| R3 | 100KΩ | ½ | RC22A104M | BTS-100K | RF Grid |
| R4 | 100KΩ | ½ | RC22A104M | BTS-100K | Converter Grid |
| R5 | 2.2 Meg. | ½ | RW2F66 | " | " |
| R6 | 3300Ω | ½ | RC23A332M | BTS-3300 | Converter Cathode |
| R7 | 22KΩ | ½ | RC22A223M | BTS-22K | Osc. Grid |
| R8 | 47KΩ | ½ | RC22A154M | BTS-47K | Converter Plate Decoupling |
| R9 | 1 Meg. | ½ | RC22A105M | BTS-1 Meg. | 1st IF Grid |
| R10 | 1 Meg. | ½ | RC22A105M | BTS-1 Meg. | " " " |
| R11 | 47KΩ | ½ | RC22A473M | BTS-47K | 1st IF Screen Decoupling Note 1 |
| R12 | 470KΩ | ½ | RC22A474M | BTS-470K | 1st IF Screen Dropping |
| R13 | 1000Ω | ½ | RC23A102M | BTS-1000 | 1st IF Plate Decoupling |
| R14 | 220KΩ | ½ | RC22A224M | BTS-220K | Line Isolation |
| R15 | 470KΩ | ½ | RC22A474M | BTS-470K | 2nd IF Grid |
| R16 | 100Ω | ½ | RC23A101M | | 2nd IF Cathode |
| R17 | 1000Ω | ½ | RC23A102M | BTS-1000 | 2nd IF Plate Decoupling Note 2 |
| R18 | 1000Ω | ½ | RC23A102M | BTS-1000 | Decoupling |
| R19 | 47KΩ | ½ | RC22A154M | BTS-47K | Diode Filter |
| R20 | 220KΩ | ½ | RC22A224M | BTS-220K | Diode Load |
| R21 | 1 Meg. | ½ | RC22A105M | BTS-1 Meg. | AVC Network |
| R22 | 68Ω | 2 | RC22A680M | | Balancing Note 3 |
| R23 | 33KΩ | ½ | RC22A333M | BTS-33K | De-emphasis |
| R24 | 15KΩ | ½ | RC22A153M | BTS-15K | Ratio Det. Diode Load Note 4 |
| R25 | 470KΩ | ½ | RC22A474M | BTS-470K | AVC Network |
| R26 | 10 Meg. | ½ | RC22A106M | BTS-10 Meg. | Delayed AVC Network |
| R27 | 100KΩ | ½ | RC22A104M | BTS-100K | Tone Compensation |
| R28 | 10 Meg. | ½ | RC22A106M | BTS-10 Meg. | " " |
| R29 | 10 Meg. | ½ | RC22A106M | BTS-10 Meg. | AF Grid |
| R30A | 250KΩ | ½ | See Note | BTS-220K | AF Plate |
| B | 500KΩ | ½ | See Note | BTS-470K | Output Grid |
| R31 | 150K | 2 | RC23A151M | BW-2-150 | Output Cathode |
| R32 | 470Ω | 1 | RC23A471M | BTS-470 | Filter |
| R33 | 68KΩ | ½ | RC22A683M | BTS-68K | Changer Isolation |
| R34 | 33Ω | 1 | RW1F06 | BW-1-33 | Sureg Limiter |
| R35A | 330KΩ | ½ | RC22A334K | BTS-330K | Phono Tone Compensation Note 5 |
| B | 2.2 Meg. | ½ | RC22A225M | BTS-2.2 Meg. | Phono Tone Compensation Note 6 |
| R36A | 68KΩ | ½ | RC23A683M | BTS-68K | Phono Shunt Note 5 |
| B | 470KΩ | ½ | RC22A474M | BTS-470K | Phono Shunt Note 6 |

Note. Items C49A, C49B, R30A and R30B are combined into one unit obtainable under MFGRS Pt. ACOC01.
Note 1. Some models use 1000Ω resistor in this application, replacement same as R2.
Note 2. Some models use 470Ω resistor in this application, IRC replacement BTS-470.
Note 3. Some models use 33Ω resistor in this application.
Note 4. Some models use 22KΩ resistor in this application, IRC replacement BTS-22K.
Note 5. Used in model 69M9.
Note 6. Used in models 69M8 and 69B8.






IF=455 KC AM

IF=10.7 MC FM

VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | V1 | 105VAC | -.4VDC | .4VDC | 1.1VAC | .4VAC | 96VDC | 96VDC | .4VDC | | |
| * | V2 | 115VAC | -.4VDC | .4VDC | -.2VDC | .2VDC | 44 VAC | 90VDC | -.1 -.4VDC | .4VDC | .6VAC |
| | V2 | 115VAC | 2VDC | -.4VDC | 2.2VDC | 3VAC | 44VAC | 110VDC | 1.5-2.5VDC | .1VDC | 3.5VAC |
| | V3 | 115VAC | -.4VDC | .1DC | 44VAC | 55VAC | 115VDC | 22VDC | .1VDC | | |
| | V3 | 115VAC | 0V | 0V | 55VAC | 65VAC | 100VDC | 100VDC | 1.5VDC | | |
| * | V4 | 115VAC | -.6VDC | -.6VDC | -.6VDC | 0V | 18VAC | -.6VDC | 0V | -.6VDC | 1.5VDC |
| | V5 | 115VAC | -.8VDC | -.8VDC | -.6VDC | 0V | 18VAC | -.8VDC | 0V | -.6VDC | 1.2VDC |
| | V5 | 115VAC | 0V | 65VAC | 11VDC | 115VDC | 0V | 185VDC | 117VAC | 11.4VDC | |

*TAKEN WITH VACUUM TUBE VOLTMETER.
† VOLTAGE AND RESISTANCE READINGS TAKEN IN FM POSITION.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.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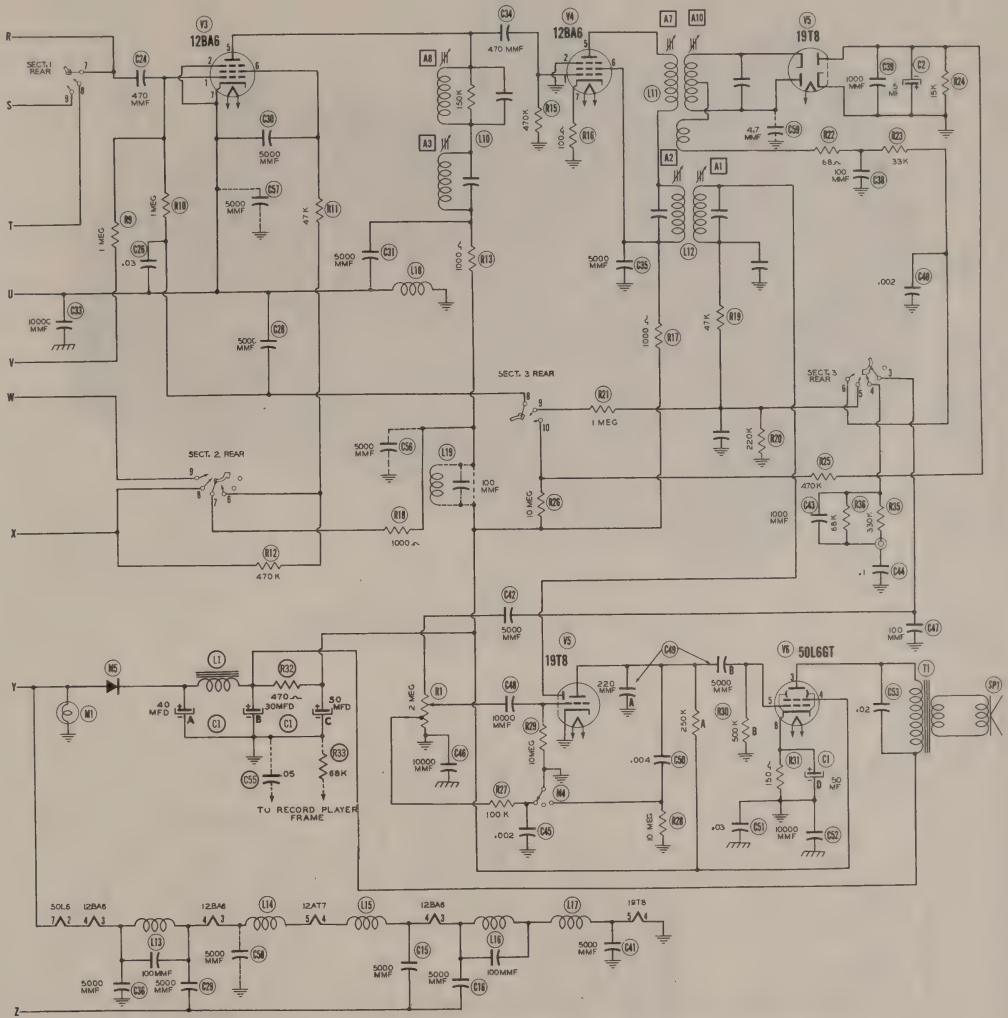


RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| ‡ $V_1$ | 12BA6 | 2.5Meg. | 0Ω | 40Ω | 300Ω | *180ΩΩ | *180ΩΩ | [illegible] | | |
| ‡ $V_{2A}$ | 12AT7 | *50KΩ | 100KΩ | 3.3KΩ | 280Ω | 29KΩ | *180ΩΩ | 22KΩ | [illegible] | 5.5KΩ |
| $V_{2B}$ | 12AT7 | *50KΩ | 5 Meg. | 3.3KΩ | 280Ω | 29KΩ | *180ΩΩ | 22KΩ | [illegible] | [illegible] |
| $V_3$ | 12BA6 | 2 Meg. | 20Ω | 270Ω | 250Ω | *1500Ω | *500KΩ | 2MΩ | | |
| $V_4$ | 12BA6 | 47MΩ | 0Ω | 2.2K | 2MΩ | *1MΩ | *1MΩ | 10KΩ | | |
| $V_{5A}$ | 19T8 | Inf. | 1MΩ | Inf. | 0Ω | 20Ω | [illegible] | [illegible] | 10 Meg. | *2MΩ |
| ‡ $V_{5B}$ | 19T8 | Inf. | 15KΩ | Inf. | 0Ω | 18Ω | 280KΩ | 0Ω | 10Meg. | *2MΩ |
| $V_6$ | 50L6 | 450Ω | 260Ω | *340Ω | 50Ω | 500KΩ | 70KΩ | 210Ω | 150Ω | |

Measured from junction of R1 and R34

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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## ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

[illegible] fully close the tuning capacitor and set pointer at extreme left-hand reference mark on dial backplate.

Calibration marks on bottom edge of dial backplate are as follows: ( Top Row-Left to Right Extreme left hand limit, 580KC, 965KC, 1475KC. (Bottom Row-Left to Right) Left hand reference, 90MC, 97MC, and 106MC.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

### AM ALIGNMENT

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1. | .01 MFD | High side to pin 2 12AT7 (V2). Low side to [illegible] | 455KC | AM (Center [illegible]ter) | Tuning cap fully open | Across Voice Coil | A1, A2 A3, A4 | Short A5 to chassis. Adjust A1, A2, A3, and A4 for maximum output. |
| 2. | 100 MMF | " | 1475KC | " | 1475KC Calibration Mark | " | A5 | Remove short. Adjust for maximum output. |
| 3. | [illegible] MMF | High side Ext. AM Antenna lead. Low side to chassis. | 1400KC | " | Tune for maximum output. | " | A6 | Adjust for maximum output. Check calibration at 580KC and 965 KC. |

### FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Before starting step 5, connect two matched 100KΩ (±5%) resistors connected in series from pin 7 of 19T8 (V5) to chassis. Connect the common lead of the VTVM to the junction of these two resistors (point B) and the DC probe to point ◇ (see schematic).

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 4. | .01 MFD | High side to pin 2 12AT7 (V2). Low side to chassis. | 10.7MC (Mod @ 400∿) | FM (fully clockwise) | Set at point of non-interference | DC Probe at Point ◇ Common lead to chassis. | A7, A8 A9 | Short A11 to chassis. Adjust for maximum output. |
| 5. | .1 MFD | " | " | " | " | See Prealignment Instructions. | A10 | Adjust for zero reading. A positive and negative reading are on either side of correct setting. After adjusting remove two 100KΩ resistors and short across A11. |

Repeat steps 4 and 5 until adjustments of A7, A8, and A9 are not required to obtain the zero reading in step 5.

If visual alignment check is not desired, continue with step 7.

### FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | SCOPE CONNECT | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 4. | .01 MFD | High side to pin 1 6BA6 (V3). Low side to chassis. | 10.7MC | FM | Set at point of non-interference | Vert. Amp to point ◇ Low side to chassis. | A7, A8 | Disconnect stabilizer cap. Adjust for maximum amplitude and symmetry as per fig 1. |
| 5. | .01MFD | High side to pin 2 12AT7 (V2). Low side to chassis. | " | " | " | " | A9 | Adjust for maximum amplitude and symmetry as per fig 1. |
| 6. | .01 MFD | " | " | " | " | Vert. Amp to point ◇ Low side to chassis. | A10 | Reconnect stabilizer cap. Adjust for maximum straightness of crossover line with crossover point occurring at center of pattern as per fig 2. |

### FM OSCILLATOR & RF AMP ALIGNMENT

In step 7, it is possible to adjust the oscillator on low frequency side of the incoming signal which is not correct. With receiver set at 106MC., turn signal generator to 84.6MC. If oscillator is operating on correct side of the signal a beat note will not be heard. If note is heard, it will be necessary to readjust A11 so oscillator operates on the other side of the incoming signal.

If calibration is not correct, the inductance of the FM Oscillator coil must be adjusted. If dial pointer is on low frequency side, the coil inductance is too low and the coil turns must be expanded slightly. Repeat step 7 until correct calibration is obtained.

To correctly adjust the inductance of the RF Coil, leave VTVM connected between Point ◇ and chassis. and tune receiver to 90MC. Insert iron core end of a tuning wand into the RF Coil. If reading on VTVM increases, the coil inductance is too low and the coil turns must be compressed slightly. If reading decreases, insert brass slug end of tuning wand. If reading increases the coil turns must be expanded slightly. Correct adjustment is obtained when insertion of either end of tuning wand causes the reading to decrease. Adjust the antenna coil in same manner.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 7. | See Fig 3. | Across FM Ant. terminal. | 106MC | FM | 106MC Calibration Mark. | DC Probe to point ◇ Common lead to chassis. | A11, A12, A13 | Adjust for maximum output. |

Check calibration at 97MC and 90MC.

FIG. 1

FIG. 2

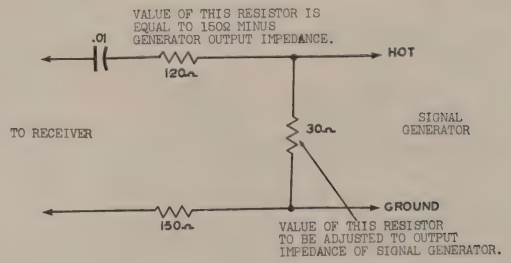


FIG. 3

CHALLENGER
MODEL CC8

CHALLENGER
MODEL CC8

| | |
|---|---|
| TRADE NAME | Challenger, Model CC8 |
| MANUFACTURER | Challenger Amplifier Co., 663 Broadway, New York 12, N.Y. |
| TYPE SET | AC Operated 2 Channel Audio Amplifier |
| TUBES (FOUR) | Types 6SF5 Mic. Pre-Amp., 6SJ7 AF Amp., 6L6GA Power Output, 5Y3GT Rectifier |
| POWER SUPPLY | 110-120 Volts AC |
| RATING | .57 Amp. @ 117 Volts AC |

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DATE 6/49 4911-4 SET #63 FOLDER 4

# PARTS LIST AND DESCRIPTIONS

CHALLENGER M DEL 008

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA PART No. | REPLACEMENT DATA STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| V1 | Mic. Pre-Amp. | [illegible] | 6AU8 | 9AW | |
| V2 | AF Amp. | [illegible] | [illegible] | 9AW | |
| V3 | Power Output | 6L6GA | 6L6GA | 7AC | |
| V4 | Rectifier | 5Y3G | 5Y3G | 4Z | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING CAP. | RATING VOLT | REPLACEMENT DATA CHALLENGER PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | [illegible] | [illegible] | | [illegible] | [illegible] 45 | | DY-4x10-450 | EL-410 | ● Filter<br>■ Filter<br>▲ Filter<br>Decoupling |
| C2 | [illegible] | [illegible] | | PRS50/50 | BR505 | | M-50-50 | TA-550 | Output Cath. Bypass |
| C3 | [illegible] | [illegible] | | BR10B/25 | CR10BA | | M-10-25 | TA-10 | AF Cath. Bypass |
| C4 | .1Meg | [illegible] | | P699-02 | GT6S2 | | ST-6-02 | TM-12 | Audio Coupling |
| C5 | .1Meg | [illegible] | | P488-05 | GT4S5 | | ST-4-05 | TM-15 | " " |
| C6 | .1Meg | [illegible] | | 1468-0001 | 5W5T1 | GP1K-100 | M0.5-31 | 1FM-31 | AF Plate Bypass |
| C7 | .1Meg | [illegible] | | P488-05 | GT4S5 | | ST-4-05 | TM-15 | AF Screen Bypass |
| C8 | .1Meg | [illegible] | | P488-05 | GT4S5 | | ST-4-05 | TM-15 | Audio Coupling |
| C9 | [illegible] | [illegible] | | P488-1 | GT4F1 | | ST-4-1 | TM-1 | Tone Comp. |
| C10 | .1Meg | [illegible] | | P488-05 | GT4S5 | | ST-4-05 | TM-15 | " " |
| C11 | .01 | [illegible] | | P488-01 | GT4S1 | GP2-335-01 | ST-4-01 | TM-11 | " " |
| C12 | .1Meg | [illegible] | | P488-05 | GT4S5 | | ST-4-05 | TM-15 | Line Filter |

## CONTROLS

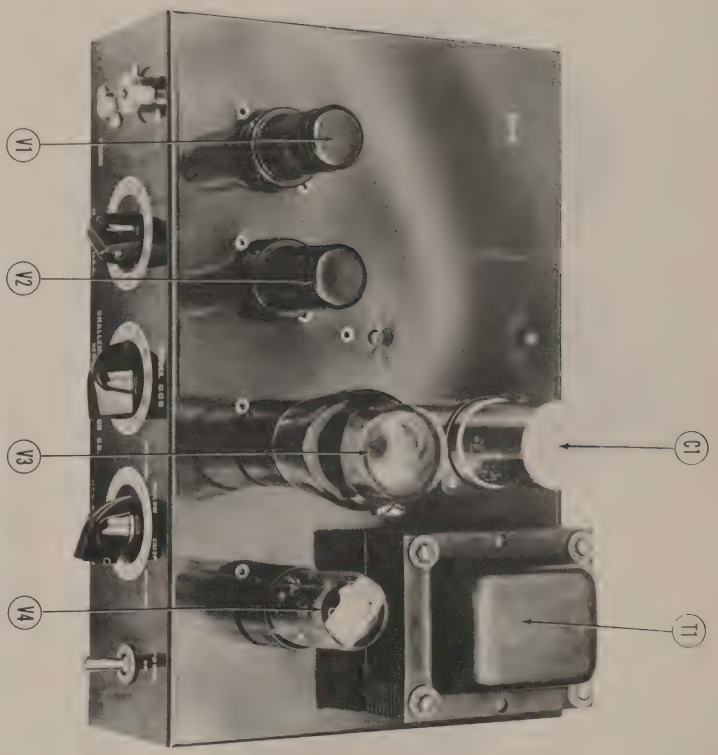
| ITEM No. | RATING RESIST-ANCE | RATING WATTS | REPLACEMENT DATA CHALLENGER PART No. | REPLACEMENT DATA IRC PART No. | REPLACEMENT DATA CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| R1A | [illegible] | ½ | V2U2-A | D13-136 | M-50-Z | Mike control |
| R1B | 5 Meg | [illegible] | Not Req. | A | Not Req. | Attach to R1A Per Instructions |
| R2A | [illegible] | ½ | V2U2-A | D13-133 | M-50-Z | Phono control |
| R2B | 5 Meg | [illegible] | Not Req. | A | Not Req. | Attach to R2A Per Instructions |

## RESISTORS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA CHALLENGER PART No. | REPLACEMENT DATA IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| R1 | 10 Meg. | [illegible] | | BTS-10 Meg. | Mike Pre. Amp. Grid |
| R2 | 270K | [illegible] | | BTS-270K | Mike Pre. Amp. Plate |
| R3 | 470K | [illegible] | | BTS-470K | Isolation |
| R4 | 470K | [illegible] | | BTS-470K | " |
| R5 | 8200 | [illegible] | | BTS-8200 | Tone Compensation |
| R6 | 8200 | [illegible] | | BTS-8200 | " " |
| R7 | 2200 | [illegible] | | BTS-2200 | " " |
| R8 | 1000 | [illegible] | | BTS-1000 | " " |
| R9 | 100 | [illegible] | | BW-½-100 | AF Cathode |
| R10 | 3300Ω | [illegible] | | BTS-3300 | " " |
| R11 | 220K | [illegible] | | BTS-220K | AF Plate |
| R12 | 1 Meg. | [illegible] | | BTS-1 Meg. | AF Screen |
| R13 | 47K | [illegible] | | BTS-47K | Filter |
| R14 | 220KΩ | [illegible] | | BTS-220K | Output Grid |
| R15 | 270 | [illegible] | | BW-2-270 | Output Cathode |
| R16 | 47K | [illegible] | | BT-2-47K | Bleeder |
| R17 | 4700 | [illegible] | | BT-2-4700 | Filter See Note |
| R | [illegible] | [illegible] | | AB-500 | Filter |

Note. Some models use 2 10KΩ resistors in parallel in this application.

## CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (POWER)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | |
|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | SEC. 3 | CHALLENGER PART No. | STANCOR PART No. | CHICAGO PART No. | MERIT PART No. |
| T1 | 117VAC @ .57A | 690VCT @ .073 ADC | 5VAC @ 2A | 6.0VAC @ 1.6A | T-362 | P-6012 | PH-70R | P-2952 |

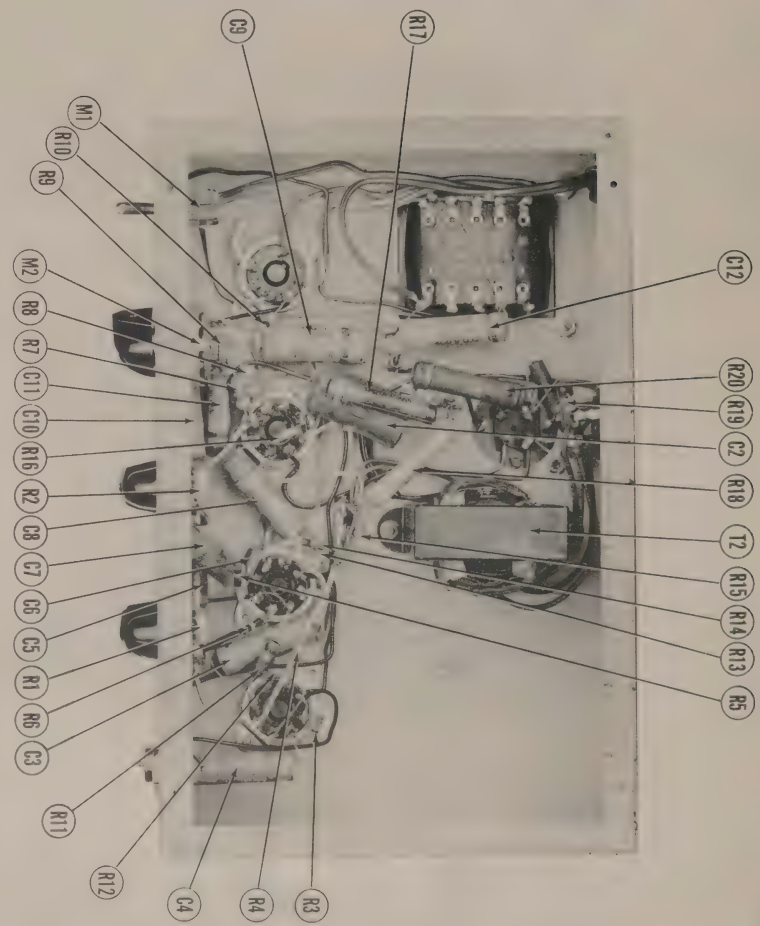
## TRANSFORMER (OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | CHALLENGER PART No. | STANCOR PART No. | CHICAGO PART No. | MERIT PART No. | |
| | PRI. | SEC. | PRI. | SEC. | | | | | |
| T2 | 3600Ω | 4Ω<br>8Ω<br>15Ω | 184Ω | .3Ω<br>.4Ω<br>.6Ω | T-262-B | A-3825 | RO-305 | A-2905* | * Drill new mounting hole. |

## MISCELLANEOUS

| ITEM No. | PART NAME | CHALLENGER PART No. | NOTES |
|---|---|---|---|
| M1 | Switch | | On-Off |
| M2 | Switch | | Tone |

# CHASSIS—BOTTOM VIEW

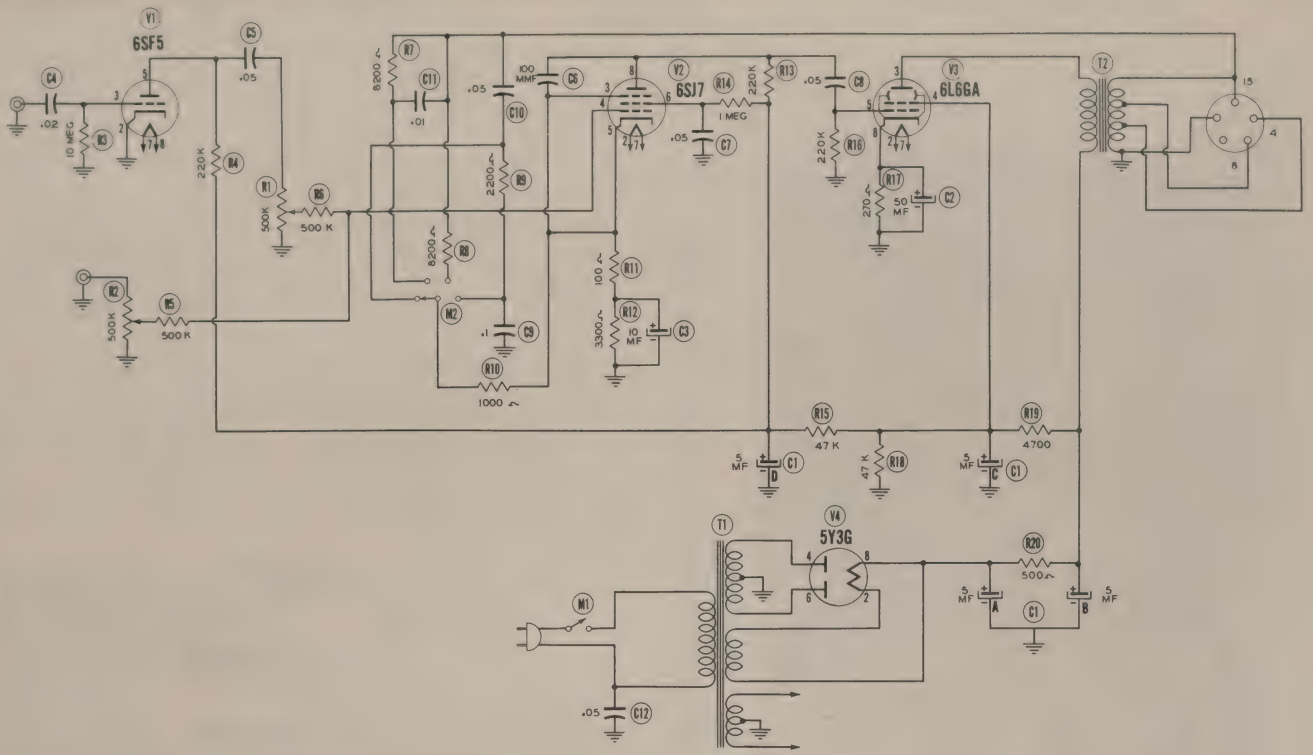




INKTE 6/49 4011-4 SET #63 FOLDER 4

CHALLENGER MODEL CC8

CHALLENGER MODEL CC8




VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| V 1 | 6SF5 | 0V | 0V | -.7VDC | 0V | 112VDC | 2.3VDC | 3.2VAC | 3.2VAC |
| V 2 | 6SJ7 | 0V | 2.2VAC | 2.4VAC | 0V | 2.4VDC | 1.7VDC | 3.2VAC | 85VDC |
| V 3 | 6L6GA | 0V | 3.2VAC | 340VDC | 285VDC | .1VDC | 0V | 3.2VAC | 18VDC |
| V 4 | 5Y3G | 0V | 390VDC | 2.4VDC | 360VAC | 0V | 360VAC | 0V | 390VDC |

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6SF5 | 0Ω | 0Ω | 1Meg. | 0Ω | *250KΩ | 3KΩ | .2Ω | .2Ω |
| 2 | 6SJ7 | 0Ω | .2Ω | 3.3KΩ | 500KΩ | 3.3KΩ | *1Meg. | .2Ω | *250KΩ |
| 3 | 6L6GA | 0Ω | .2Ω | *85KΩ | *5KΩ | 25KΩ | .5Ω | .2Ω | 270Ω |
| 4 | 5Y3G | Inf. | 50KΩ | 3.3KΩ | 130Ω | Inf. | 140Ω | Inf. | 50KΩ |

* Measured from pin 8 of V4

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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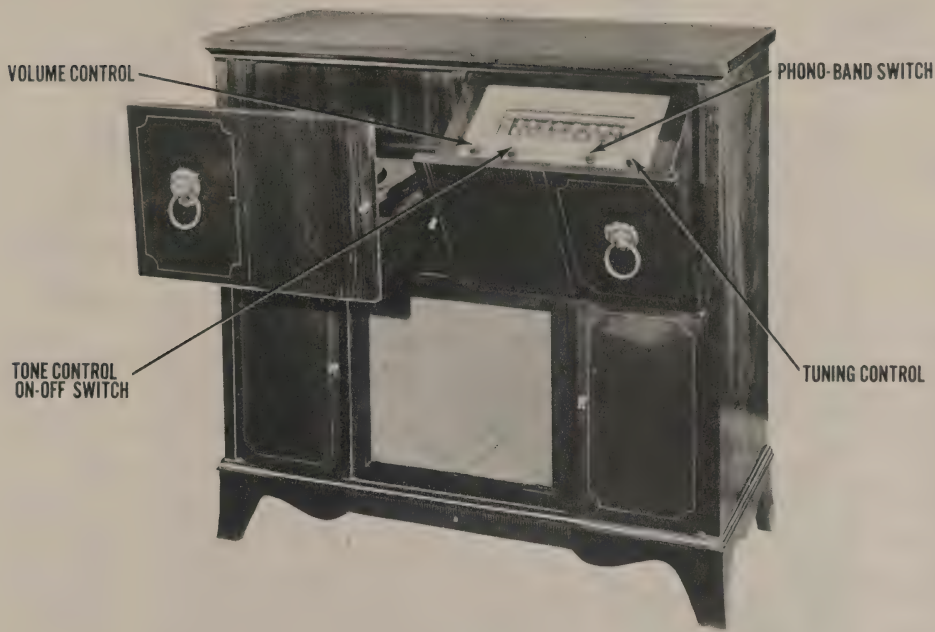
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.




CROSLEY MODELS
9-204, 9-205M

CROSLEY MODELS
9-204, 9-205M

CROSLEY MODEL 9-205M

| | |
|---|---|
| TRADE NAME | Crosley Models 9-204, 9-205M |
| MANUFACTURER | Crosley Corp., 1329 Arlington St., Cincinnati, Ohio |
| TYPE SET | AC Operated Combination Phono-Radio, AM-FM Superheterodyne Receiver with Loop Antenna. |
| TUBES (NINE) | Types 6SG7 RF Amp., 6AC7 Mixer, 7F8 Oscillator, 6SG7 1st IF Amp., 6SG7 FM 2nd IF Amp., 6AL5 Ratio Det., 6SQ7 AM DET-AVC-AF 6V6GT Power Output, 5Y3GT Rectifier |
| POWER SUPPLY | 105-125 Volts AC RATING .67 Amp. @ 117 Volts AC |
| TUNING RANGE-BROADCAST | 540-1600KC FREQ. MOD. 88-108MC |

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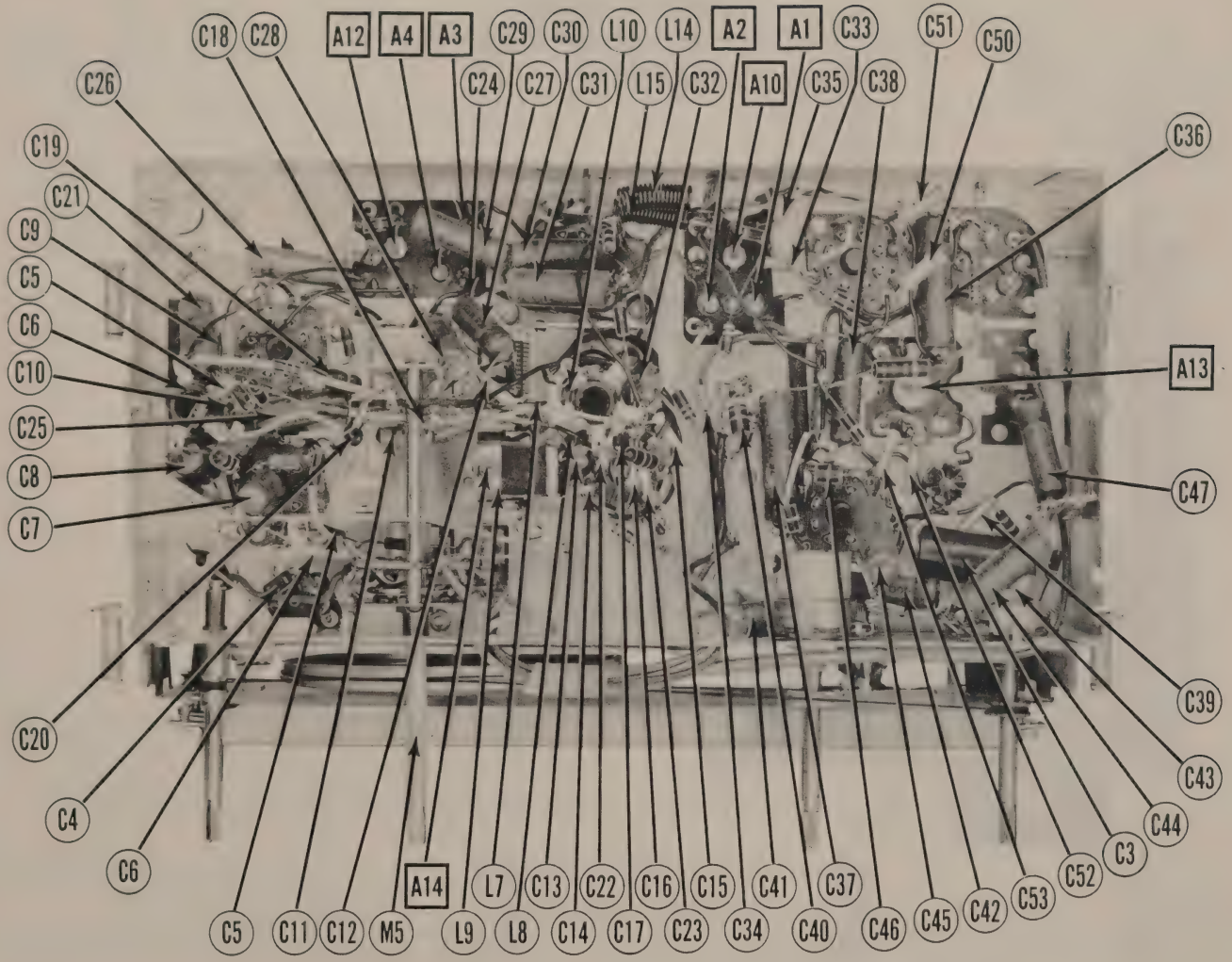

C18
C28
A12
A4
A3
C29
C30
L10
L14
A2
A1
C33
C51
C50
C26
C24
C27
C31
L15
C32
A10
C35
C38
C36
C19
C21
C9
C5
C6
C10
A13
C25
C8
C47
C7
C39
C20
C43
C4
C44
C3
C6
C52
A14
L7
C13
C22
C16
C15
C41
C37
C53
C5
C11
C12
M5
L9
L8
C14
C17
C23
C34
C40
C46
C45
C42

R28
R1
R27
R30
R2
R29
R19
R14
R15
R13
R3
R5
R4
R24
R25
R26
R23
R22
R21
R20
R18
R17
R16
R10
R9
R12
R11
R8
R7
R6

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: CROSLEY PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| V1 | RF Amp. | 6BA7 | 6BA7 | 6BK | |
| V2 | Mixer | 6AW7 | 6AW7 | 6BK | |
| V3 | Oscillator | 6AV7 | 6AV7 | 6BK | |
| V4 | 1st IF Amp. | 6BA7 | 6BA7 | 6BK | |
| V5 | FM 2nd IF Amp. | 6BA7 | 6BA7 | 6BK | |
| V6 | Det-Amp-Limiter | 6AL5 | 6AL5 | 6AT | |
| V7 | AM DET-AVC-AF | 6BA7 | 6BA7 | 6BK | |
| V8 | Power Output | 6V6GT | 6V6GT | 6AC | |
| V9 | Rectifier | 6X4GT | 6X4GT | 6F | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: CROSLEY PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1 | .05 | 400 | 140068 | P489Q-50 | 5S544 | | UT-50-450 | UT-50 | Filter |
| C2A | .05 | 400 | 143089 | AF862J4A | UP43145 | | DY-406 | EL-424 | ● Filter |
| B | .05 | 400 | | | C | | | | ■ Filter |
| C | .05 | 400 | | | | | | | ▲ Filter |
| D | .05 | 400 | | | | | | | Output Cath. Bypass |
| C3 | .1 | 200 | 142958 | PRS150/4 | BR415 | | M-4-450 | TVA-13 | Stabilizing Cap. |
| C4 | 47 | 200 | 137727-81 | 1468-00008 | 5W5Q4 | GP1K-50 | MO.5-45 | 1FM-45 | Ext. Ant. Isolation |
| C5 | 100 | 200 | 137727-12 | 1468-0001 | 5W5T1 | GP1K-100 | MO.5-51 | 1FM-51 | RF Coupling |
| C6 | 1 | 400 | 137727-9 | 1468-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | AVC Filter |
| C7 | .005 | 600 | 39001-11 | P688-005 | GT6D5 | GP2M-005 | ST-6-005 | TM-25 | RF Screen Bypass |
| C8 | .1 | 600 | 39001-13 | P688-01 | GT6S1 | GP2-335-01 | ST-6-01 | TM-11 | RF Plate Decoupling |
| C9 | 25 | 25 | 137727-45 | | | | | | Fixed Trimmer |
| C10 | 68 | | 137398-5 | | | N90K-3 | | | RF Coupling |
| C11 | 6.8 | | 137727-73 | 1468-00004 | 5W5Q4 | GP1K-50 | MO.5-44 | 1FM-44 | " " |
| C12 | 47 | | 137727-20 | 1468-0001 | 5W5T1 | GP1K-100 | MO.5-31 | 1FM-31 | " " |
| C13 | 91 | | 137727-53 | 1468-00004 | 5W5Q3 | N90L-33 | MO.5-43 | MS-43 | Osc. Feedback |
| C14 | 68 | | 137727-53 | 1468-00004 | 5W5Q3 | N90L-33 | MO.5-43 | MS-43 | Osc. Grid Cap. |
| C15 | 68 | | 137727-8 | 1468-0001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | Osc. Plate Bypass |
| C16 | 1000 | | 137727-79 | 1468-000005 | 5W5V5 | N90K-5 | MO.5-55 | MS-55 | Osc. Feedback |
| C17 | 47 | | 137727-31 | 1468-00005 | 5W5Q5 | GP1K-50 | MO.5-45 | 1FM-45 | Osc. Grid Cap. |
| C18 | 5 | | 137727-79 | 1468-000005 | 5W5V5 | N90K-5 | MO.5-55 | MS-55 | Osc. Coupling |
| C19 | 100 | | 137727-25 | 1468-0001 | 5W5T1 | GP1K-100 | MO.5-31 | 1FM-31 | RF Coupling |
| C20 | 43 | | 137727-43 | 1468-00001 | 5W5Q1 | GP1K-15 | MO.5-41 | MS-415 | " " |
| C21 | .1 | 600 | 39001-13 | P688-01 | GT6S1 | GP2-335-01 | ST-6-01 | TM-11 | Decoupling |
| C22 | 1000 | | 137727-8 | 1468-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | Osc. Fil. Bypass |
| C23 | 1000 | | 137727-8 | 1468-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | " " " |
| C24 | 4.7 | | 137398-6 | 1469-000005 | 5R5V5 | N90K-5 | MO5.5-55 | MS-55 | Fixed Trimmer |
| C25 | .005 | 600 | 39001-11 | P688-005 | GT6D5 | GP2M-005 | ST-6-005 | TM-15 | 1st IF Screen Bypass |
| C26 | .005 | 600 | 39001-11 | P688-005 | GT6D5 | GP2M-005 | ST-6-005 | TM-15 | Mixer Decoupling |
| C27 | .005 | 600 | 39001-11 | P688-005 | GT6D5 | GP2M-005 | ST-6-005 | TM-15 | Mixer Plate Decoup. |
| C28 | .1 | 600 | 39001-17 | P688-05 | GT6S5 | | ST-4-05 | TM-17 | AVC Filter |
| C29 | .1 | 600 | 39001-13 | P688-01 | GT6S1 | GP2-335-01 | ST-4-01 | TM-11 | " |
| C30 | .005 | 600 | 39001-11 | P688-005 | GT6D5 | GP2M-005 | ST-6-005 | TM-25 | 1st IF Screen Bypass |
| C31 | .05 | 600 | 39001-13 | P688-01 | GT6S1 | GP2-335-01 | ST-6-01 | TM-11 | 1st IF Decoupling |
| C32 | .01 | 600 | 39001-13 | P688-01 | GT6S1 | GP2-335-01 | ST-6-01 | TM-11 | Decoupling |
| C33 | 1000 | | 137727-8 | 1468-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | 2nd IF Grid Filter |
| C34 | 1000 | | 137727-8 | 1468-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | " " " " |
| C35 | .05 | 200 | 39001-80 | P488-02 | GT6S2 | | ST-4-02 | TM-12 | 2nd IF Cath. Bypass |
| C36 | .05 | 600 | 39001-80 | P688-025 | GT6S25 | | ST-6-02 | TM-12 | 2nd IF Decoupling |
| C37 | .05 | 600 | 39001-80 | P688-025 | GT6S25 | | ST-6-02 | TM-12 | Decoupling |
| C38 | .004 | 600 | 39001-74 | P688-002 | GT6D2 | GP2M-002 | ST-6-002 | TM-22 | De-emphasis |
| C39 | 1000 | | 137727-8 | 1468-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | RF Bypass |
| C40 | 50 | | 143686-1 | 1468-00005 | 5W5Q5 | GP1K-50 | MO.5-45 | 1FM-45 | Diode Filter |
| C41 | .005 | 600 | 39001-11 | P688-005 | GT6D5 | GP2M-005 | ST-6-005 | TM-25 | Audio Coupling |
| C42 | .05 | 600 | 39001-11 | P688-005 | GT6D5 | GP2M-005 | ST-6-005 | TM-25 | " " |
| C43 | 82 | | 140068-2 | 1469-000020 | 5W5Q3 | N90L-33 | MO.5-43 | MS-43 | Tone Comp. |
| C44 | .05 | 600 | 39001-11 | P688-005 | GT6D5 | GP2M-005 | ST-6-005 | TM-25 | " " |
| C45 | .1 | 600 | 39001-13 | P688-01 | GT6S1 | GP2-335-01 | ST-6-01 | TM-11 | " " |
| C46 | 50 | | 143686-1 | 1468-00005 | 5W5Q5 | GP1K-50 | MO.5-45 | 1FM-45 | AF Plate Bypass |
| C47 | .05 | 600 | 39001-11 | P688-005 | GT6D5 | GP2M-005 | ST-6-005 | TM-25 | Audio Coupling |

# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING: IMPEDANCE PRI. | RATING: IMPEDANCE SEC. | RATING: DC RES. PRI. | RATING: DC RES. SEC. | REPLACEMENT DATA: CROSLEY PART No. | REPLACEMENT DATA: STANCOR PART No. | REPLACEMENT DATA: CHICAGO PART No. | REPLACEMENT DATA: MERIT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| T1 | 5200Ω | 8.6Ω | 500Ω | .6Ω | 136101-2 | A-3049‡ | RO-9 | A-2902§ | § Drill one new mounting hole. ‡ Drill new mounting holes |

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA: CROSLEY PART No. | REPLACEMENT DATA: JENSEN PART No. | REPLACEMENT DATA: QUAM PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| SP1 | FIELD PM | V. C. IMP. 3.6Ω | 138762-5 | ST-110 M.D.P10-T# | 10A31 | Original Part # C-143456. # Replace output transformer to match 8-3Ω Speaker. |
| SP2 | CONE Dia. 9 7/16" | V. C. DIA. 1" | | | | |

## R F COILS

| ITEM No. | USE | DC RES. PRI. | DC RES. SEC. | REPLACEMENT DATA: CROSLEY PART No. | REPLACEMENT DATA: MEISSNER PART No. | |
|---|---|---|---|---|---|---|
| L1 | FM Dipole Ant. | 0Ω | | | | |
| L2 | FM Ant. | 0Ω | | 143784 | | |
| L3 | AM Loop Ant. | 0Ω | | 143807 | | |
| L4 | AM Ant. | 75Ω | 2.3Ω | 143267 | 14-1056 | |
| L5 | RF Choke | .6Ω | | 143752 | | |
| L6 | AM RF Coil | 70Ω | 7Ω | 143402 | 14-1057 | |
| L7 | FM RF Coil | 0Ω | | 143646 | | |
| L8 | RF Choke | 8Ω | | 143837 | | |
| L9 | FM Osc.Assy | 0Ω | | 143305 | | |
| L10 | AM Osc. | 8Ω | | 143945 | | |
| L11A | AM 1st IF | 6.2Ω | 6.5Ω** | 143090 | | ** Includes both sec. windings |
| B | FM 1st IF | .2Ω | | | | |
| L12A | FM 2nd IF | | .4Ω | 143105 | | |
| B | AM 2nd IF | 6.4Ω†† | | | | †† Includes both pri. windings |
| L13 | Ratio Det. | .7Ω | .5Ω | 143378 | | |
| L14 | Fil. Choke | 0Ω | | 143934 | | |
| L15 | Fil. Choke | 0Ω | | 143934 | | |

## DIAL LIGHTS

| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA: CROSLEY PART No. | | NOTES |
|---|---|---|---|---|---|---|---|
| M1 | Bayonet | 6-8V | 0.15A | Brown | 48858 | | Type #47 |
| M2 | Bayonet | 6-8V | 0.15A | Brown | 48858 | | Type #47 |
| M3 | Bayonet | 6-8V | 0.15A | Brown | 48858 | | Type #47 |

## PHONO CARTRIDGE

| ITEM No. | REPLACEMENT DATA: CROSLEY PART No. | REPLACEMENT DATA: ASTATIC PART No. | REMARKS |
|---|---|---|---|
| M4 | | LT-3X | |

## MISCELLANEOUS

| ITEM No. | PART NAME | CROSLEY PART No. | NOTES |
|---|---|---|---|
| M5 | Switch | 142969 | Band |
| M6 | Tuning Gang | 142848 | |
| A5 | Trimmer | 136327-43 | BC Osc. Adj. |
| A16 | Trimmer | 143014 | FM Ant. Sec. Adj. |
| | Cabinet | 144045 | 9-204 |
| | Cabinet | 143947 | 9-205M |
| | Dial Scale | 144168 | |
| | Knob | 138576-6 | |
| | Knob | 143778 | Band Switch |
| | Dial Pointer | 143769 | |

# PARTS LIST AND DESCRIPTIONS (Continued)

| ITEM No. | RATING CAP. | RATING VOLT | REPLACEMENT DATA CROSLEY PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C43 | .001 | 600 | 39001-11 | P688-005 | GT2L5 | GP2M-005 | ST-6-005 | TM-25 | Output Plate Bypass |
| C44 | .5 | 200 | 39001-87 | P488-22 | GT2L25 | | ST-2-25 | TC-2 | Bias Filter |
| C45 | 5.0 | | 137727-33 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | 2nd IF Fil. Bypass |
| C51 | [illegible] | | 137727-28 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | " " " " |
| C52 | 1.0 | | 137727-8 | 1468-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | Det.-AF Fil. Bypass |
| C53 | 1.0 | | 137727-8 | 1468-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | " " " " |

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA CROSLEY PART No. | IRC PART No. | CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| R1A | .5 Meg. | 2 | 39368-19 | D18-139X | | Volume Control tapped @ 750KΩ |
| B | Shaft | | 39370-2 | E | | Attach to R1A Per Instructions |
| R2A | .5 Meg. | ½ | 39368-22 | | | Tone Control. |
| B | Shaft | | 39370-2 | | | |
| C | Switch | | 39363-1 | | | |

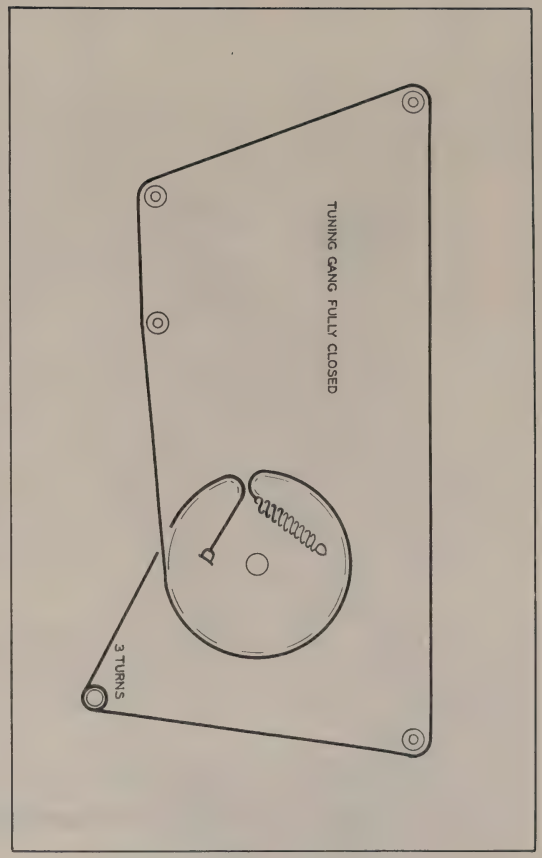
## RESISTORS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA CROSLEY PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| R3 | 1.5 Meg. | ½ | 39373-94 | BTS-1.5 Meg. | AVC Network |
| R4 | 100K | ½ | 39373-74 | BTS-100K | " " |
| R5 | 1 Meg. | ½ | 39373-92 | BTS-1 Meg. | RF Grid |
| R6 | 68K | ½ | 39373-71 | BTS-68K | RF Screen Bleeder |
| R7 | 22K | 1 | 39373-170 | BTA-22K | RF Screen Decoupling |
| R8 | 1000 | ½ | 39373-33 | BTS-1000 | RF Decoupling |
| R9 | 2.5K | ½ | 39373-19 | | " " |
| R10 | 1 Meg. | ½ | 39373-92 | BTS-1 Meg. | Mixer Grid |
| R11 | 120K | ½ | 39373-75 | BTS-120K | Mixer Screen |
| R12 | 2200 | ½ | 39370-40 | BTS-2200 | Mixer Decoupling |
| R13 | 68K | ½ | 39370-71 | BTS-68K | FM Oscillator Grid |
| R14 | 100K | ½ | 39370-74 | BTS-100K | AM Oscillator Grid |
| R15 | 22K | 1 | 39370-170 | BTA-22K | AM Oscillator Plate |
| R16 | 1 Meg. | ½ | 39370-92 | BTS-1 Meg. | AVC Network |
| R17 | 39K | ½ | 39370-65 | BTS-39K | IF Screen |
| R18 | 2200 | ½ | 39370-40 | BTS-2200 | IF Decoupling |
| R19 | 470K | ½ | 39370-97 | BTS-470K | Diode Load |
| R20 | 47K | ½ | 39370-67 | BTS-47K | Diode Filter |
| R21 | 47K | ½ | 39370-67 | BTS-47K | 2nd IF Grid Filter |
| R22 | 22K | ½ | 39370-60 | BTS-22K | 2nd IF Grid Load |
| R23 | 270 | ½ | 39370-21 | | 2nd IF Cathode |
| R24 | 39K | ½ | 39370-65 | BTS-39K | 2nd IF Bleeder |
| R25 | 33K | 1 | 39370-174 | BTA-33K | 2nd IF Decoupling |
| R26 | 39K | ½ | 39370-65 | BTS-39K | De-emphasis |
| R27 | 27K | ½ | 39370-62 | BTS-27K | Ratio Detector Diode Load |
| R28 | 68K | ½ | 39370-71 | BTS-68K | Tone Compensation |
| R29 | 10 Meg. | ½ | 39370-107 | BTS-10 Meg. | AF Grid |
| R30 | 220K | ½ | 39370-80 | BTS-220K | AF Plate Load |
| R31 | 470K | ½ | 39370-87 | BTS-470K | Output Grid |
| R32 | 270 | 1 | 39370-131 | BTA-270K | Output Cathode |
| R33 | 1K | ½ | 39373-8 | BW-½-1K | Bias Network |
| R34 | 1 Meg. | ½ | 39370-92 | BTS-1 Meg. | " " |
| R35A | 700 | 5 | 137728-1 | AP-700 | Filter |
| B | 400Ω | 5 | | AP-400 | Filter |
| R36 | 1000Ω | 2 | 39373-253 | BT-2-1000 | Filter |
| R37 | 220Ω | ½ | 39373-19 | BW-½-220 | Decoupling |

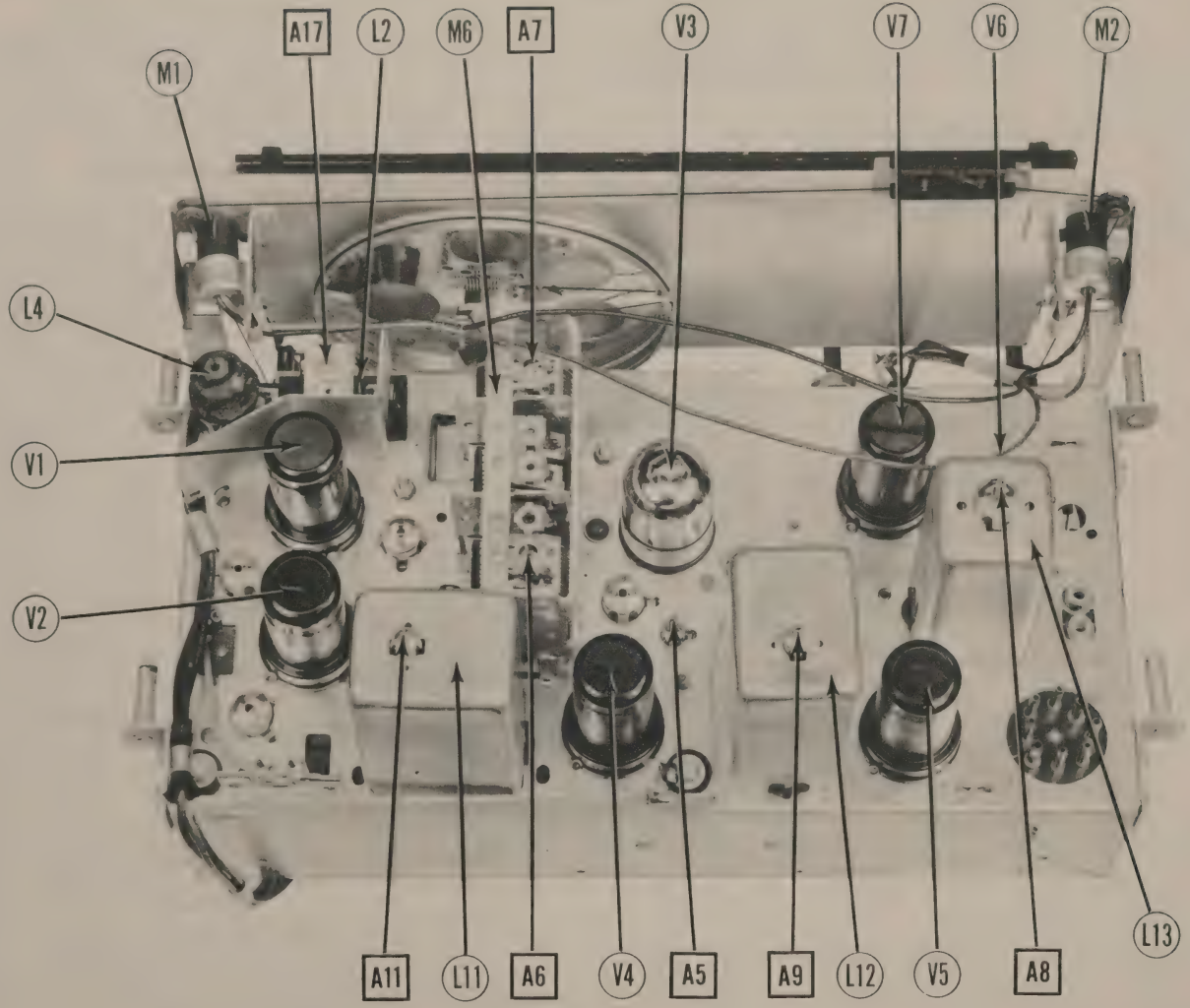
## TRANSFORMER (POWER)

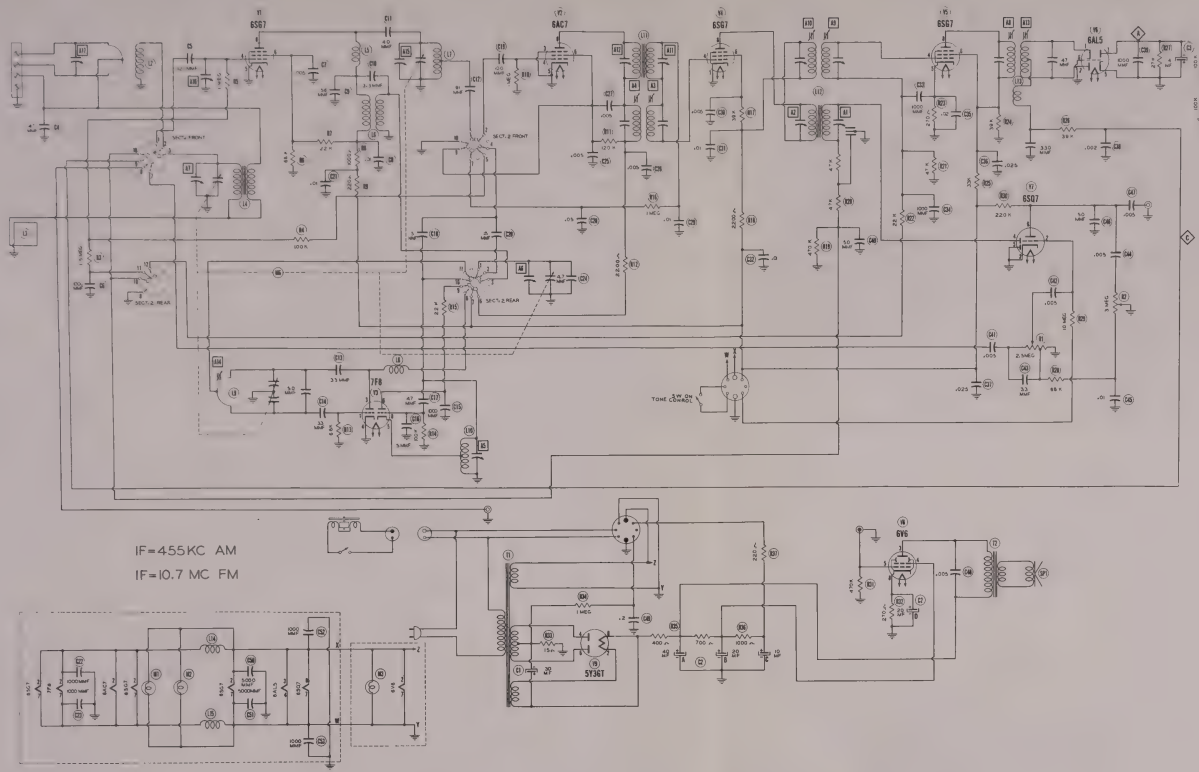
| ITEM No. | RATING PRI. | RATING SEC. 1 | RATING SEC. 2 | RATING SEC. 3 | REPLACEMENT DATA CROSLEY PART No. | STANCOR PART No. | CHICAGO PART No. | MERIT PART No. |
|---|---|---|---|---|---|---|---|---|
| T1 | 117VAC 60 CY 85 WATTS | 650VAC CT @ .082ADC | 5VAC 2A | 6.5VAC 3.2A | 135104 | P-6012 * † | PH-90 * | P-2952 * |

* Add series resistor to reduce plate voltage.
† Mount vertically with universal mounting brackets.




DIAL CORD DRIVE


A17
L2
M6
A7
V3
V7
V6
M2
M1
L4
V1
V2
A11
L11
A6
V4
A5
A9
L12
V5
A8
L13




VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6SG7 | 0V | 5.1 VDC | 0V | -.7VDC | 0V | 115VAC | 0V | 0.6VDC |
| 2 | 6AC7 | 0V | -.15VDC | 0V | -.7VDC | 0V | -.7VDC | 0V | .65VDC |
| 3 | 7F8 | 45VAC | 45VAC | 0V | 0V | 0V | 160VDC | 0V | 5-115VDC |
| 4 | 6SG7 | 0V | 6.3VAC | 0V | -.8VDC | 0V | 205VDC | 0V | 200VDC |
| 5 | 6AL5 | 0V | 6.3VAC | 115VA | 0V | 0V | 115VAC | 0V | 65VDC |
| 6 | 6AL5 | 0V | -.2VDC | 6.3VAC | 0V | 0V | 3-.9VDC | 0V | 1-2.5VDC |
| 7 | 6SG7 | 0V | -.6VDC | 0V | -.4VDC | 0V | 125VDC | 0V | 6.3VAC |
| 8 | 6V6GT | 0V | 6.3VAC | 2.0VDC | 270VDC | 0V | -.2VDC | 0V | 12VDC |
| 9 | 5Y3GT | 0V | 360VAC | 0V | 330VAC | 0V | 350VAC | -1.2KVAC | 360VAC |

*EARTH WITH VACUUM TYPE VOLTMETER.

† VOLTAGE AND RESISTANCE READINGS TAKEN IN FM POSITION

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6SG7 | 0Ω | 12 | 0Ω | 2.2M Ω | 0Ω | 470KΩ | ∞ | 460Ω |
| 2 | 6AC7 | 0Ω | 14 | 0Ω | 2.2MΩ | 0Ω | 136KΩ | ∞ | 0Ω |
| 3 | 7F8 | 0.6Ω | 0Ω | 0Ω | 450KΩ | 0Ω | 160Ω | 0Ω | 1.1MΩ |
| 4 | 6SG7 | 0Ω | 0Ω | 0Ω | 2.2MΩ | 0Ω | 240Ω | 0Ω | 0.65Ω |
| 5 | 6AL5 | 0Ω | 0Ω | 0Ω | 0Ω | 0Ω | 0Ω | 0Ω | 0Ω |
| 6 | 6AL5 | 0Ω | 270Ω | 0Ω | 0Ω | 0Ω | 270Ω | 0Ω | 0Ω |
| 7 | 6SG7 | 0Ω | 13.2KΩ | 0Ω | 600KΩ | 0Ω | 250KΩ | ∞ | 0Ω |
| 8 | 6V6GT | Inf. | 0Ω | 850Ω | 3.1MΩ | 470KΩ | 3.2MΩ | 0Ω | 220Ω |
| 9 | 5Y3GT | Inf. | 40Ω | Inf. | 180Ω | Inf. | 170Ω | 0Ω | 0Ω |

*Measured from pin 8 of tube 9

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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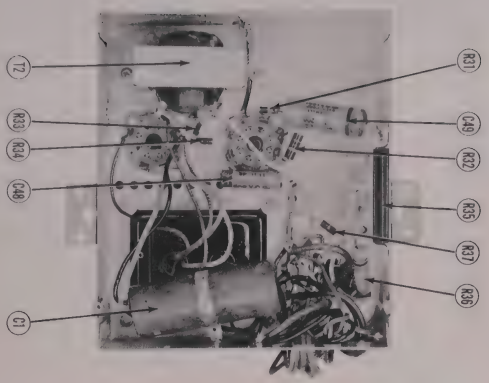


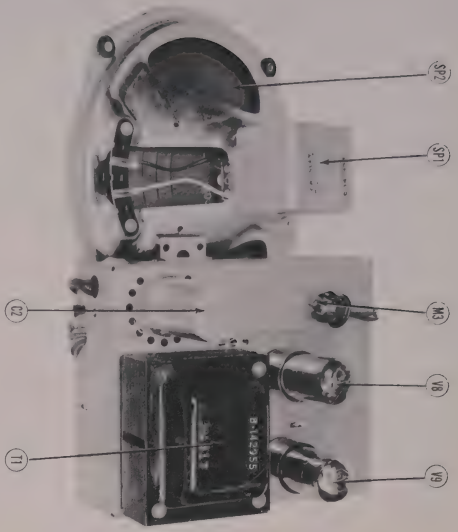


**ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT**

To set dial pointer turn tuning capacitor fully closed and set pointer at the edge of the clear glass section of the dial to the left of the low frequency end of the dial.

During alignment, the shorting link on the antenna terminal strip should be removed. Replace this link after aligning the receiver unless external antenna is to be used.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

**AM ALIGNMENT**

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1. | .01MFD | High side to pin 4 (Grid) 6BD7 (V4). Low side to chassis. | 455KC | AM | Tuning cap fully open | Across voice coil | A1,A2 | Adjust for maximum output |
| 2. | .01MFD | High side to rear AM stator of tuning cap. Low side to chassis. | " | " | " | " | A3,A4 | " " " " |
| 3. | | Loop | 1400KC | " | " | " | A5,A6 A7 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |

**FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM**

Before starting step 7, connect two matched (± 5%) 100KΩ resistors in series from pin 2 of 6AL5 (V6) to chassis. Connect common lead of VTVM to junction (Point B) of the two 100KΩ resistors. Connect DC probe of VTVM to point C as indicated on schematic.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 4. | 1000MMF | High side to pin 4 (Grid) 6BD7 (V3). Low side to chassis. | 10.7MC | FM | Tuning cap fully closed | DC Probe to point C. Common to chassis. | A8 | Adjust for maximum deflection. |
| 5. | 1000MMF | High side to pin 4 (Grid) 6BD7 (V4). Low side to chassis. | " | " | " | " | A9, A10 | " " " " |
| 6. | 1000MMF | High side to rear FM stator of tuning cap. Low side to chassis. | " | " | " | " | A11, A12 | " " " " |
| 7. | 1000MMF | " | " | " | " | DC Probe to point C. Common lead to point B. | A13 | Adjust for zero reading. A positive and negative reading are on either side of correct setting. |

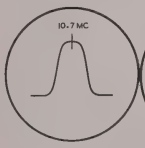


FIG. 1

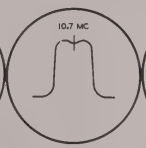


FIG. 2

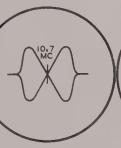


FIG. 3

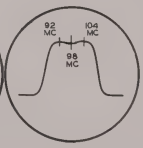


FIG. 4

**FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE**

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | BAND SWITCH POS. | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 4. | 1000MMF | High side to pin 4 (Grid) 6BD7 (V4). Low side to chassis. | 10.7MC (450KC Sweep) | 10.7MC | FM | Vert. Amp. to point C. Low side to chassis. | A8, A9, A10 | Disconnect stabilizer capacitor C3. Adjust A8, A9, A10 for maximum amplitude and symmetry as per Fig.1. |
| 5. | 1000MMF | High side to rear FM stator of tuning cap. Low side to chassis. | " | " | " | " | A11, A12 | Adjust for maximum amplitude and symmetry as per Fig.2. |
| 6. | 1000MMF | " | " | " | " | Vert. Amp. to point C. Low side to chassis. | A12 | Reconnect stabilizer cap. C3. Adjust A13 so crossover occurs at center of pattern as per Fig. 3. Slightly retouch A8 for maximum amplitude and symmetry, if necessary. Continue with step 8. |

**FM RF ALIGNMENT**

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 8. | Two 39Ω carbon res. | Insert a 39Ω resistor in each lead of signal generator and connect across FM antenna terminals. | 98MC | FM | 98MC | DC Probe to point C. Common to chassis. | A14 | Adjust for maximum deflection. |
| 9. | Two 39Ω carbon res. | " | 104MC | " | 104MC | " | A15 | Rock tuning gang if necessary and adjust for maximum deflection. |
| 10. | Two 39Ω carbon res. | " | 92MC | " | 92MC | " | L7 | Compress or expand FM RF coil for maximum sensitivity. Check with tuning wand. |
| 11. | Two 39Ω carbon res. | " | 98MC | " | 98MC | " | A16 | Shunt FM antenna coil primary with 10Ω carbon resistor. Adjust A16 for maximum deflection. |
| 12. | Two 39Ω carbon res. | " | " | " | " | " | A17 | Move 10Ω shunt to secondary of FM antenna coil and adjust primary (A17) for maximum deflection. |

**FM INPUT RESPONSE CHECK**

It is not absolutely necessary to perform this check but if signal generator capable of 20MC sweep at 98MC is available it is advisable to check the response of the input system. In order to see the pattern desired the vertical amplifier of the oscilloscope must be set for maximum gain.

| DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | BAND SWITCH POS. | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| Two 39Ω carbon res. | Insert a 39Ω res. in each lead of signal generator and connect across FM antenna terminals. | 98MC (20MC Sweep) | 92MC 98MC 104MC | FM | Vert. Amp. to pin 4 (Grid) 6BD7 (V1). Low side to chassis. | A16, A17 | Adjust A16 and A17 so markers appear as per Fig. 4. |

DEWALD MODEL
B-515 (BATTERY-LINE OPERATED)

DEWALD MODEL
B-515 (BATTERY-LINE OPERATED)

DEWALD MODEL B-515

| | |
|---|---|
| **TRADE NAME** | Dewald, Model B-515 |
| **MANUFACTURER** | Dewald Radio Mfg., Corp., 35-15 37th Ave., Long Island City, New York |
| **TYPE SET** | Three Power Operated Portable Superheterodyne Receiver with Loop Antenna |
| **TUBES** (FOUR) | Types 1R5 Converter, 1T4 IF Amp., 1U5 DET-AVC-AF, 3V4 Power Output |
| POWER SUPPLY | 105-125 Volts AC-DC or 4.5 Volts "A" Supply and 67.5 Volts "B" Supply |
| RATING | .16 Amp. @ 117 Volts AC or 110MA @ 4.5 Volts DC and 11MA @ 67.5 Volts DC |
| **TUNING RANGE—BROADCAST** | 535-1700KC **SHORT WAVE** 4.6-15MC |

**ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT**

Pre-set the trimmer A9 on the rear section of the tuning gang by backing out to minimum capacity. Leave A9 at this setting.

To set pointer turn tuning cap. fully closed and set pointer to last reference mark at low frequency end of dial.

Use battery power when available. If AC power is used, use an isolation transformer when avialable. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1. | | High side to a one turn loop coupled to receiver loop ant. Low side thru .1MFD to chassis. | 455KC | BC | Tuning gang fully open | Across voice coil | A1, A2 A3, A4 | Adjust for maximum output. |
| 2. | | " | 1700KC | " | " | " | A5 | " " " " |
| 3. | | " | 600KC | " | 600KC | " | A6 | Rock tuning gang and adjust for maximum output. Repeat steps 2 & 3. |
| 4. | Direct | High side to short wave ant. lead. Low side thru .1MFD to chassis. | 15MC | SW | Tuning gang fully open | " | A7 | Adjust for maximum output. |
| 5. | Direct | " | 14MC | " | Tune for maximum signal. | " | A8 | Rock tuning gang and adjust for maximum output. |
| | | | | | | | | |

**HOWARD W. SAMS & CO., INC. • Indianapolis Indiana**

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# PARTS LIST AND DESCRIPTIONS

DEWALD MODEL M-615

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: DEWALD PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| V1 | Converter | 1R5 | 1R5 | TA7 | |
| V2 | IF Amp. | 1T4 | 1T4 | 6AR | |
| V3 | DET., AVC-AF Amp. | 1V6 | 1V6 | 6BW | |
| V4 | Power Amp. | 3V4 | 3V4 | 6BX | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: DEWALD PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | [illegible] | 150 | 2-200D | [illegible] | BL1S15 | | USB-5030-150 | TA-530 | Filter Yellow |
| B | 30 | 150 | | | BRH151 | | M-100-15 | UHC-115 | Filter Red |
| C | 150 | 15 | | | | | | | Fil. Bypass Blue |
| C2 | .01 | 400 | | P488-01 | GT4S1 | GP2-335-01 | ST-4-01 | TM-11 | Line Isolation |
| C3 | .05 | 200 | | P288-05 | GT2S5 | | ST-4-05 | 68P16 | AVC Filter |
| C4 | 47 | | | 1468-00005 | 5W5Q5 | GP1K-50 | MO.5-45 | 1FM-45 | Osc. Grid Cap. |
| C5 | .02 | 200 | | P488-02 | GT2S2 | | ST-4-02 | 68P15 | RF Bypass |
| C6 | .05 | 200 | | P288-05 | GT2S5 | | ST-4-05 | 68P16 | Filament Bypass |
| C7 | 100 | | | 1468-0001 | 5W5T1 | GP1K-100 | MO.5-31 | 1FM-31 | Diode Filter |
| C8 | .001 | 600 | | P688-001 | GT6D1 | GP2L-001 | ST-6-001 | TM-21 | Audio Coupling |
| C9 | .01 | 200 | | P288-015 | GT2S1 | GP2-335-01 | ST-4-01 | 68P14 | AF Screen Bypass |
| C10 | 100 | | | 1468-0001 | 5W5T1 | GF1K-100 | MO.5-31 | 1FM-31 | AF Plate Bypass |
| C11 | [illegible] | [illegible] | | [illegible] | [illegible] | GP2-335-01 | ST-4-01 | 68P14 | Audio Coupling |
| C12 | .001 | 600 | | P688-001 | GT6D1 | GP2L-001 | ST-6-001 | TM-21 | Output Plate Bypass |
| C13 | .05 | 400 | | P488-05 | GT4S5 | | ST-4-05 | TM-15 | Line Filter |
| C14 | [illegible] | [illegible] | | P288-02 | GT2S5 | | ST-4-02 | TM-12 | IF Screen Bypass Note |

Note. Not used in all models.

## CONTROLS

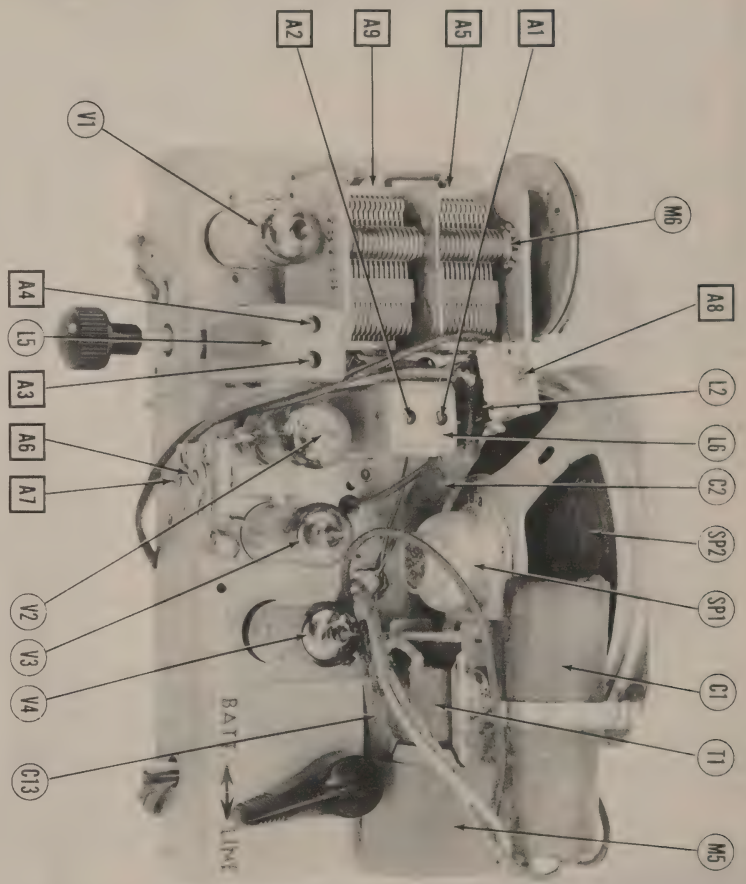
| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: DEWALD PART No. | IRC PART No. | CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| R1A # | 1 Meg. SWITCH | ½ | 30-12 Not Req. | | 15/16-63-Z DPST-SW | Volume control Attached at factory. |

# Set slider at 21002
Note. Not used in all models.

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: DEWALD PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| R2 | [illegible] | ½ | | BTS-100K | Osc. Grid |
| R3 | 1 K. | ½ | | BTS-10K | IF Screen See Note |
| R4 | 3.3 Meg. | ½ | | BTS-3.3 Meg. | AVC Network |
| R5 | 3.3 Meg. | ½ | | BTS-3.3 Meg. | " " |
| R6 | 10 Meg. | ½ | | BTS-10 Meg. | AF Grid |
| R7 | 4.7 Meg. | ½ | | BTS-4.7 Meg. | AF Screen |
| R8 | 1 Meg. | ½ | | BTS-1 Meg. | AF Plate |
| R9 | 1 Meg. | ½ | | BTS-1 Meg. | Output Grid |
| R10 | 1 K | ½ | | BW-½-150 | Bias Network |
| R11 | 2700 | ½ | | BTS-2700 | Filter |
| R12A | 10 | 1 | 3011 | AS-75 | Filter-Voltage Dropping |
| # | 21000 | 10 | | APA-2250# | " " |
| R13 | [illegible] | ½ | | BW-½-27 | Filament String |
| R14 | [illegible] | ½ | | BTS-1200 | " " |
| R15 | 270 | ½ | | BW-½-270 | " " |
| R16 | [illegible] | ½ | | BW-½-220 | " " |
| R17 | [illegible] | ½ | | BW-½-180 | " " |

# CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | DEWALD PART No. | STANCOR PART No. | CHICAGO PART No. | MERIT PART No. | |
| | PRI. | SEC. | PRI. | SEC. | | | | | |
| T1 | 10KΩ | 3.5Ω | 630Ω | .5Ω | | A-3879 | RO-16 | A-2932 | Bend mounting tabs down. |

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
| | FIELD | V. C. IMP. | DEWALD PART No. | JENSEN PART No. | QUAM PART No. | | |
| SP1 | [illegible] | 3.5Ω | 7003B3 | S7-113* P4-X | 4A07* | | * Remount output transformer |
| SP2 | D.C. Res. 3 3/4" | V. C. Dia. 9/16" | | | | | |

## R F COILS

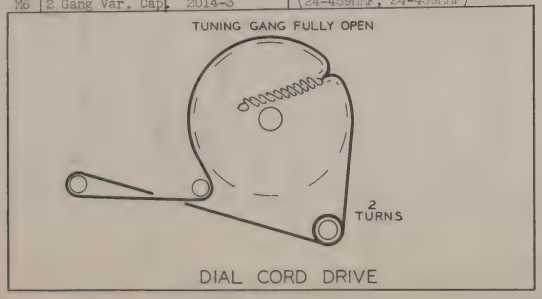
| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | |
|---|---|---|---|---|---|---|
| | | PRI. | SEC. | DEWALD PART No. | MEISSNER PART No. | |
| L1 | Loop Ant. | 3Ω | | 1037-2 | | |
| L2 | SW. Ant. | .2Ω | .1Ω | 1076 | | |
| L3 | SW. Osc. | .2Ω | .6Ω | 1075 | | |
| L4 | AM. Osc. | 1.3Ω | 6Ω | 1084 | | |
| L5 | Input IF | 17Ω | 19Ω | 1027D-4 | 16-6668 | |
| L6 | Output IF | 17Ω | 15Ω | 1027D-2 | 16-6669 | |

## BATTERIES

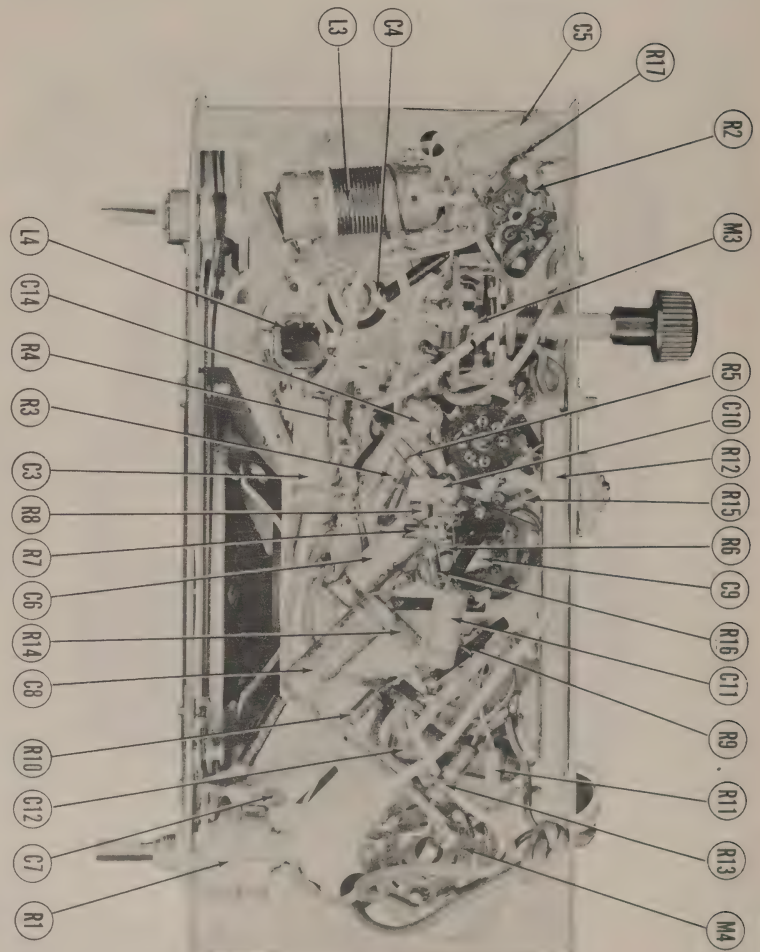
| ITEM No. | VOLTAGE | DEWALD PART No. | REPLACEMENT DATA | | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | | | EVEREADY | | | BURGESS | | | |
| | | | "A" | "B" | "A-B" | "A" | "B" | "A-B" | |
| M1 | 4.5V"A" 67.5V"B" | | 746 | 467 | | G3 | XX45 | | |

## MISCELLANEOUS

| ITEM No. | PART NAME | DEWALD PART No. | NOTES |
|---|---|---|---|
| M3 | Switch | | Band |
| M4 | Switch | | AC/DC-Battery |
| M5 | Rectifier | 8018A | Selenium |
| M6 | 2 Gang Var. Cap. | 2014-3 | (24-459MMF, 24-459MMF) |



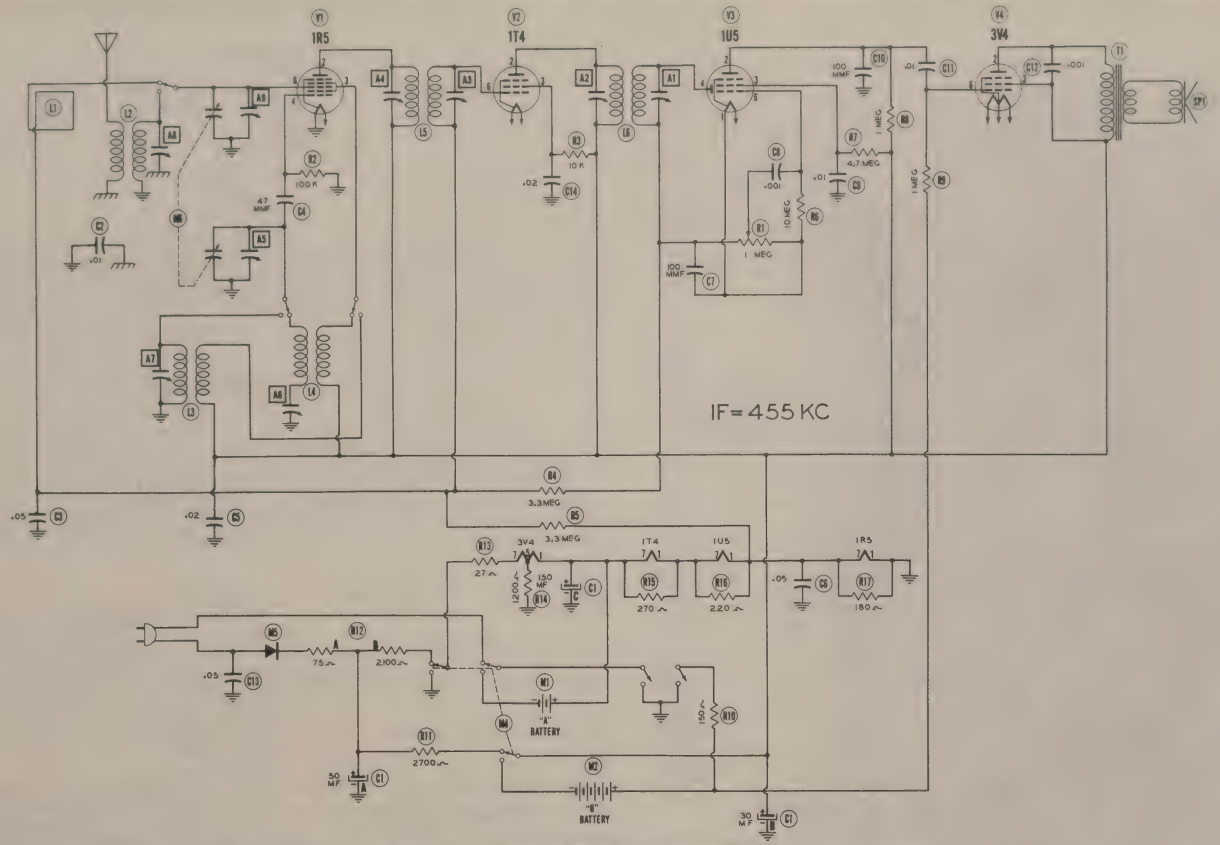

# CHASSIS—BOTTOM VIEW




DATE 6/49 4911-6 SET #63 FOLDER 6

DEWALD MODEL B-515

DEWALD MODEL B-515




VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 |
|---|---|---|---|---|---|---|---|---|
| V 1 | 1R5 | 0V | 85VDC | 85VDC | 5-7.5VDC | 0V | .3VD | 1.5VDC |
| V 2 | 1T4 | 2.6VDC | 85VDC | 76VDC | 0V | 2.6VDC | .3VDC | 4.3VDC |
| V 3 | 1U5 | 1.5VDC | 15VDC | 14VDC | .3VDC | 0V | 0V | 2.8VDC |
| V 4 | 3V4 | 4.3VDC | 89VDC | 86VDC | 0V | 5.7VDC | 0V | 7.2VDC |

TAKEN WITH VACUUM TUBE VOLTMETER.

VOLTAGE AND RESISTANCE READINGS TAKEN IN AC-DC POSITION.

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 |
|---|---|---|---|---|---|---|---|---|
| V 1 | 1R5 | * | 12.7K2 | 12.7K2 | 100K2 | * | 1.8Meg. | * |
| V 2 | 1T4 | * | 12.7K2 | 112K2 | Inf. | * | 1.8Meg. | * |
| V 3 | 1U5 | * | 11Meg. | 14.7Meg. | 800K2 | Inf. | 10Meg. | * |
| V 4 | 3V4 | * | 13K2 | 12.7K2 | 1K2 | * | 1Meg. | * |

*DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.
† Measured from junction M5 and R.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

EMERSON MODELS
561, 615 (CH. 120001B)

EMERSON MODELS
561, 615 (CH. 120001B)

EMERSON MODEL 561

| | |
|---|---|
| **TRADE NAME** | Emerson, Models 561, 615 (Ch. 120001B) |
| **MANUFACTURER** | Emerson Radio & Phonograph Corp., 111 Eighth Avenue, New York 11, New York |
| **TYPE SET** | AC - DC Operated Superheterodyne Receiver with Loop Antenna. |
| **TUBES** (Six) | Types 12SG7 Mixer, 6SS7 Oscillator, 6SS7 IF Amp., 12AT6 Det-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier. |
| **POWER SUPPLY** | 105-125 volts AC - DC |
| **TUNING RANGE—BROADCAST** | 540 - 1620KC RATING .24 Amp @ 117 Volts AC |

**ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT**

To set pointer turn tuning cap. fully closed and set pointer to last reference mark at low frequency end of dial.

Use isolation transformer if available. If not, connect a .1 MFD cap. in series with low side of signal generator and chassis.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1 | 0.1MFD. | High side to pin 4 (grid) of 12SG7 (V1). Low side to chassis. | 455 KC | Variable condenser fully open | Across voice coil. | A1, A2, A3, A4, | Adjust for maximum output. If isolation transformer is not used, reduce dummy ant. to 0.001 mfd. to reduce hum modulation. |
| 2 | 200MMFD. | High side to external antenna lead. Low side to chassis. | 1620 KC | Variable condenser fully open. | Across voice coil | A5 | Adjust for maximum output |
| 3 | 200MMFD. | High side to external antenna lead. Low side to chassis | 1400 KC | Tune for maximum output. | Across voice coil. | A6 | Adjust for maximum output. |

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# PARTS LIST AND DESCRIPTIONS

EMERSON MODEL 561

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: EMERSON PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| V1 | Mixer | 12SK7 | 12SK7 | 7K | |
| V2 | Osc. | 6SK7 | 6SK7 | 7N | |
| V3 | IF Amp. | 6SK7 | 6SK7 | 7N | |
| V4 | Det -AVC -AF Amp | 12AV6 | 12AV6 | 7M | |
| V5 | Power Output | 50L6GT | 50L6GT | 7AC | |
| V6 | Rectifier | 35Z5GT | 35Z5GT | 6AL | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: EMERSON PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | 80 | 150 | 925112 | PR5A150/50-50 | EDL5515 | | DSB-2x50-150 | TA-505 | Filter Green |
| C1B | 80 | 150 | | | | | | | Filter Red |
| C2 | .02 | 200 | 920100 | P488-02 | GT2S2 | | ST-4-02 | TM-12 | Mixer Cath. Bypass |
| C3 | .15 | 200 | 920050 | P238-15 | GT4P2 | | ST-4-2 | 68P39 | Line Isolation Note 1 |
| C4 | 110 | 500 | 910010 | 1468-0001 | 5W5T1 | GP1K-100 | MO.5-31 | 1FM-31 | Osc. Grid Cap. Note 2 |
| C5 | .1 | 200 | 920040 | P288-1 | GT2P1 | | ST-2-1 | TM-1 | AVC Filter |
| C6 | 110 | 500 | 910010 | 1468-0001 | 5W5T1 | GP1K-100 | MO.5-31 | 1FM-31 | Diode Filter |
| C7 | 220 | | 910000 | 1468-0002 | 5W5T2 | GP2K-200 | MO.5-32 | 1FM-32 | Diode Filter |
| C8 | .002 | 600 | 920010 | P688-002 | GT6D2 | GP2M-002 | ST-6-002 | TM-22 | Audio Coupling |
| C9 | .0002 | 600 | | 1468-0002 | 5W5T2 | GP2K-200 | MO.5-32 | 1FM-32 | AF Plate Bypass Note 3 |
| C10 | .0002 | 600 | | 1468-0002 | 5W5T2 | GP2K-200 | MO.5-32 | 1FM-32 | AF Plate Bypass Note 3 |
| C11 | .02 | 400 | 920020 | P488-02 | GT4S2 | | ST-4-02 | TM-12 | Audio Coupling |
| C12 | .02 | 400 | 920020 | P488-02 | GT4S2 | | ST-4-02 | TM-12 | Output Plate Bypass |
| C13 | .05 | 400 | 920030 | P488-05 | GT4S5 | | ST-4-05 | TM-15 | Line Filter |

Note 1. When item C3 is replaced, wind 9 turns hook-up wire on new unit and replace in circuit as per original unit.
Note 2. Not used in all models.
Note 3. Some models use 500MMF in this application.

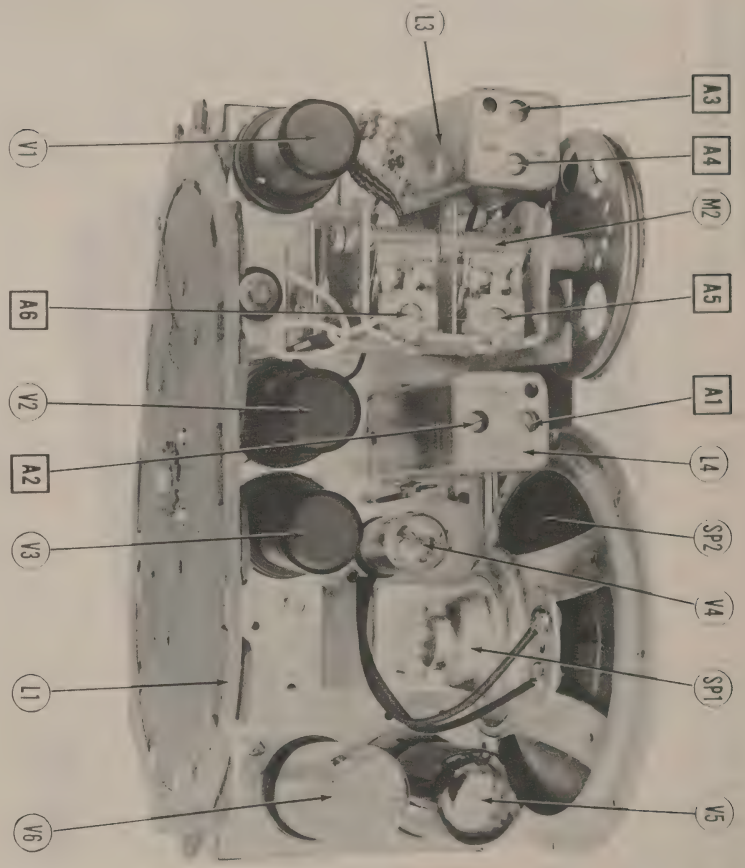
## CONTROLS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: EMERSON PART No. | IRC PART No. | CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| R1A | 500KW | ½ | 390044 | D11-133 | AM-58-S | Volume Control |
| R1B | Shaft | | Not Req. | E | KSS-3 | Attach to R1A Per Instr. |
| R1C | Switch | | Not Req. | 41 | SW-A | Attach to R1A Per Instr. |

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: EMERSON PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| R2 | 68K | ½ | 340450 | BTS-680 | Mixer Cathode |
| R3 | 22K | ½ | 340810 | BTS-22K | Osc. Grid |
| R4 | 220K | ½ | 341050 | BTS-220K | Line Isolation |
| R5 | 3.3MEG | ½ | 341330 | BTS-3.3MEG | AVC Network |
| R6 | 47K | ½ | 340890 | BTS-47K | Diode RF Filter |
| R7 | 15MEG | ½ | 341490 | BTS-15MEG | AF Grid |
| R8 | 470K | ½ | 341130 | BTS-470K | AF Plate |
| R9 | 470K | ½ | 341130 | BTS-410K | Output Grid |
| R10 | 150 | ½ | 340290 | BW-½-150 | Output Cathode |
| R11 | 1.5K | 1 | 370480 | BTA-1000 | Filter |
| R12 | 39 | 1 | 370180 | | Rectifier Ballast |

## CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | EMERSON PART No. | STANCOR PART No. | CHICAGO PART No. | MERIT PART No. | |
| | PRI. | SEC. | PRI. | SEC. | | | | | |
| T1 | 2400Ω | 3.5Ω | 164Ω Tap 4Ω 4.5Ω | .5Ω | 734043 | A-3330 | RO-3 | A-3031 | |

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | | | EMERSON PART No. | JENSEN PART No. | QUAM PART No. | |
| | Field | V. C. Imp. | 180045 | ST-105 P5-X | 5A07 | |
| SP1 | PM | 3.5Ω | | | | |
| | CONE DIA. | V.C. DIA. | | | | |
| SP2 | 4 3/4" | 3/16" | | | | |

## R F COILS

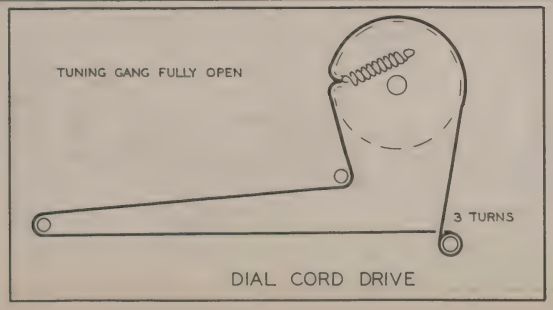
| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | |
|---|---|---|---|---|---|---|
| | | PRI. | SEC. | EMERSON PART No. | MEISSNER PART No. | |
| L1 | Loop Ant. | 3Ω | | 700000 | | |
| L2 | Osc. Coil | 1Ω | 5Ω | 716025 | 14-1060 | |
| L3 | Input IF | 42Ω | 31Ω | 720061 | 16-6658 | |
| L4 | Output IF | 32Ω | 34Ω | 720036 | 16-6660 | |

## DIAL LIGHTS

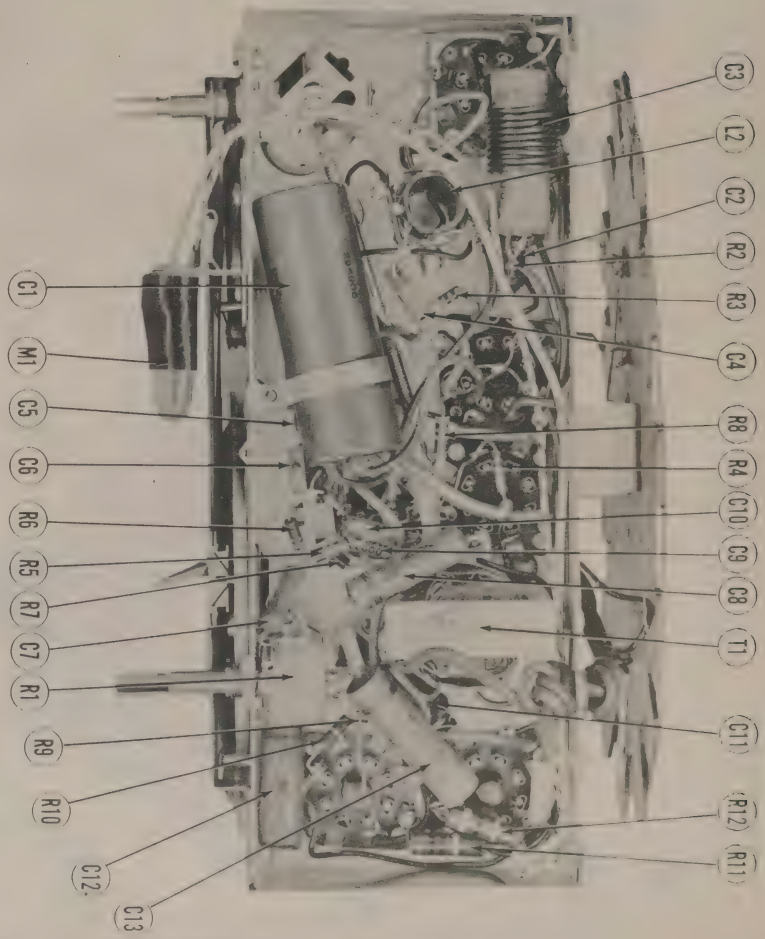
| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|---|
| | | | | | EMERSON PART No. | | |
| M1 | Bayonet | 6-8V | 0.15A | Brown | 807000 | | Type #47 |

## MISCELLANEOUS

| ITEM No. | PART NAME | EMERSON PART No. | NOTES |
|---|---|---|---|
| M2 | 2 Gang Var. Cap. | 300127 | (18-384 MMF 32-202 MMF) |
| | Cabinet | 140126 | |
| | Knob | 4[illegible]10 | |
| | Dial Pointer | 1[illegible]024 | |

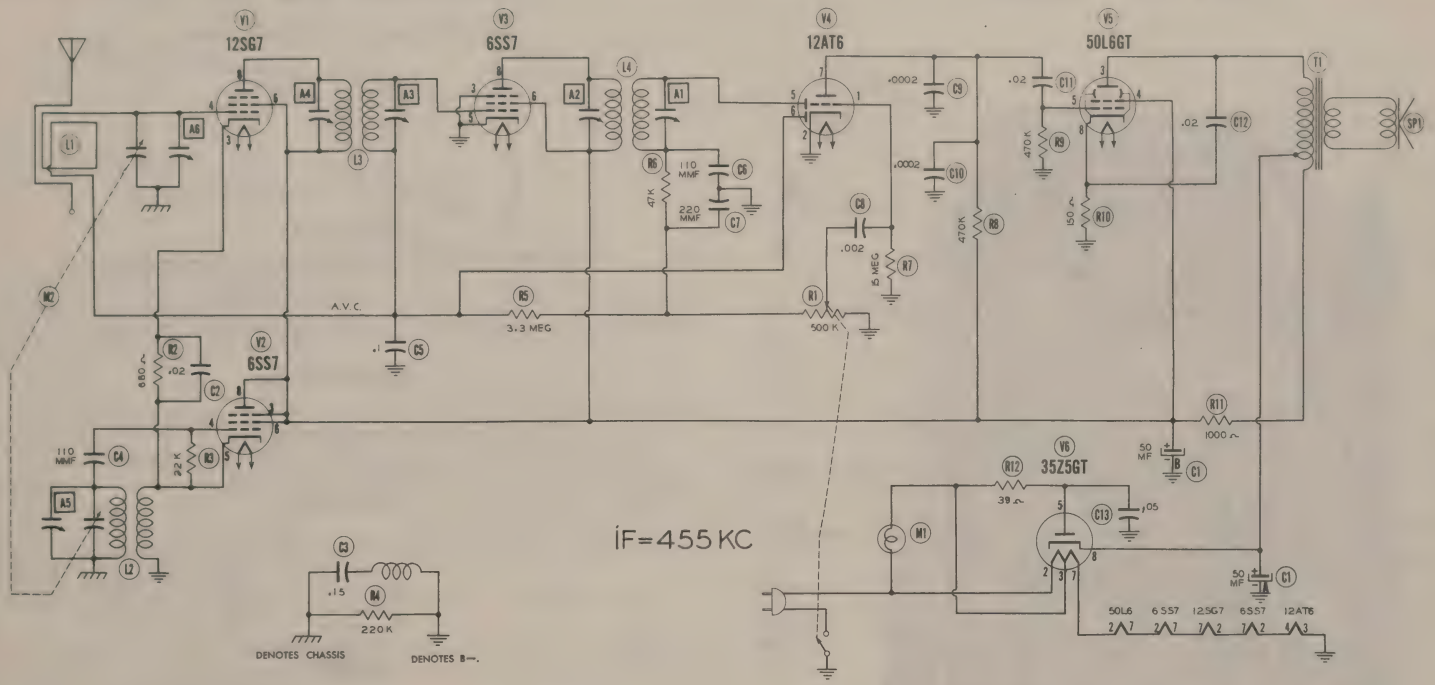



## CHASSIS—BOTTOM VIEW






EMERSON MODEL 961




VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| V 1 | 12SG7 | 0V | 12VAC | 2.4VDC | -.6VDC | 2.4VDC | 85VDC | 32VAC | 85VDC |
| V 2 | 6SS7 | 0V | 12VAC | 86VDC | -7.6VDC | 0V | 85VDC | 16VAC | 85VDC |
| V 3 | 6SS7 | 0V | 32VAC | 0V | -.6VDC | 0V | 85VDC | 32VAC | 85VDC |
| V 4 | 12AT7 | -.2VDC | 0V | 0V | 12VAC | -.2VDC | -.6VDC | 77VDC | |
| V 5 | 50L6GT | 0V | 85VAC | 105VDC | 85VDC | 0V | 0V | 35VAC | 5.3VDC |
| V 6 | 35Z5GT | 0V | 117VAC | 112VAC | 105VDC | 110VAC | 0V | 85VAC | 108VDC |

TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| V 1 | 12SG7 | 220KΩ | 19Ω | 680Ω | 4 Meg. | 680Ω | *1.00Ω | 32Ω | *10.0Ω |
| V 2 | 6SS7 | 220KΩ | 14Ω | *1000Ω | 22KΩ | 1Ω | *1000Ω | 19Ω | *1000Ω |
| V 3 | 6SS7 | 220KΩ | 38Ω | 0Ω | 4 Meg. | 0Ω | *1000Ω | 32Ω | *1000Ω |
| V 4 | 12AT7 | 1.5 Meg. | 0Ω | 0Ω | 1MΩ | 680KΩ | 4 Meg. | *470KΩ | |
| V 5 | 50L6GT | Inf. | 90Ω | *160Ω | *1000Ω | 470KΩ | Inf. | 38Ω | 15Ω |
| V 6 | 35Z5GT | Inf. | 125Ω | 120Ω | 100KΩ | 150Ω | Inf. | 90Ω | 100KΩ |

*Measured from pin 8 of V6

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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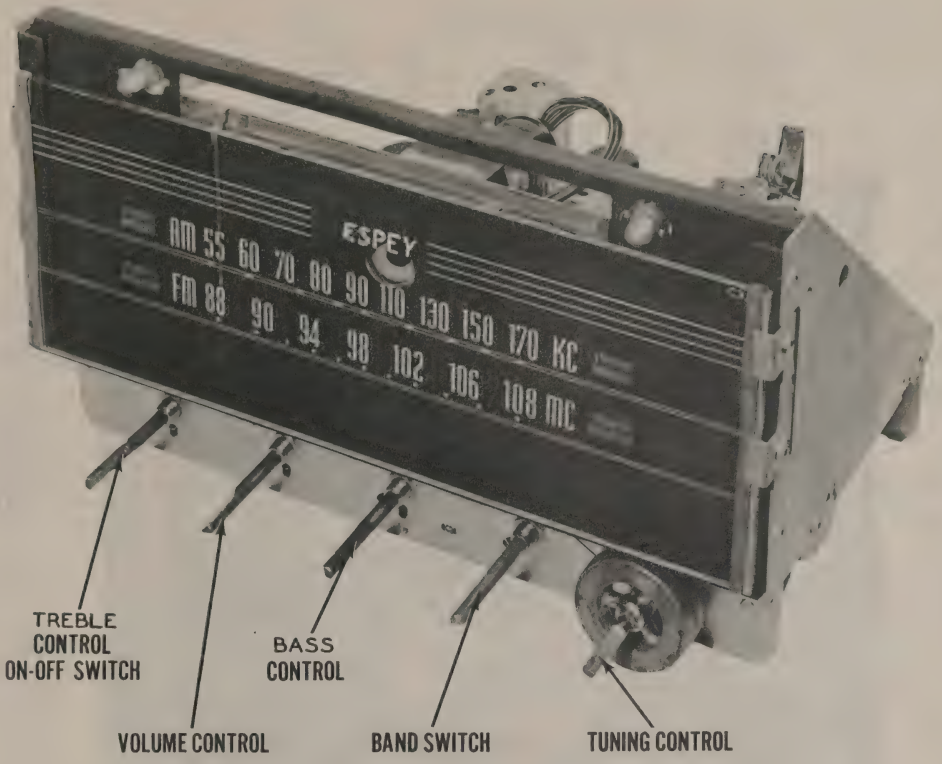
4911-7

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

ESPEY MODELS
513, 514


ESPEY
AM 55 60 70 80 90 110 130 150 170 KC
FM 88 90 94 98 102 106 108 mc
TREBLE CONTROL ON-OFF SWITCH
BASS CONTROL
VOLUME CONTROL
BAND SWITCH
TUNING CONTROL

ESPEY MODELS
513, 514

| | |
|---|---|
| TRADE NAME | Espey, Models 513, 514 |
| MANUFACTURER | Espey Mfg. Co., Inc.,528 E. 72nd St., New York, N. Y. |
| TYPE SET | AC Operated AM-FM Superheterodyne Receiver with Loop Antenna |
| TUBES (Nineteen) | Types 6BA6 FM RF Amp., 6BA6 AM RF Amp., 6C4 FM Osc., 6BE6 FM Mixer, 6BE6 AM Converter, 6SG7 1st IF Amp., 6SH7 FM 2nd IF Amp., 6AL5 FM Det., 6J5 AM-Det-AVC, 6SQ7 AF Amp., 6U5/6G5 Tuning Indicator, 6J5 AF Amp., 6J5 Phase Inverter (4) 6V6GT Power Output, (2) 5Y3GT Rectifier. |
| POWER SUPPLY | 105-125 Volts AC — RATING 1.25 Amp. @ 117 Volts AC |
| TUNING RANGE-BROADCAST | 535-1720KC — FREQ. MOD. 88-108MC |

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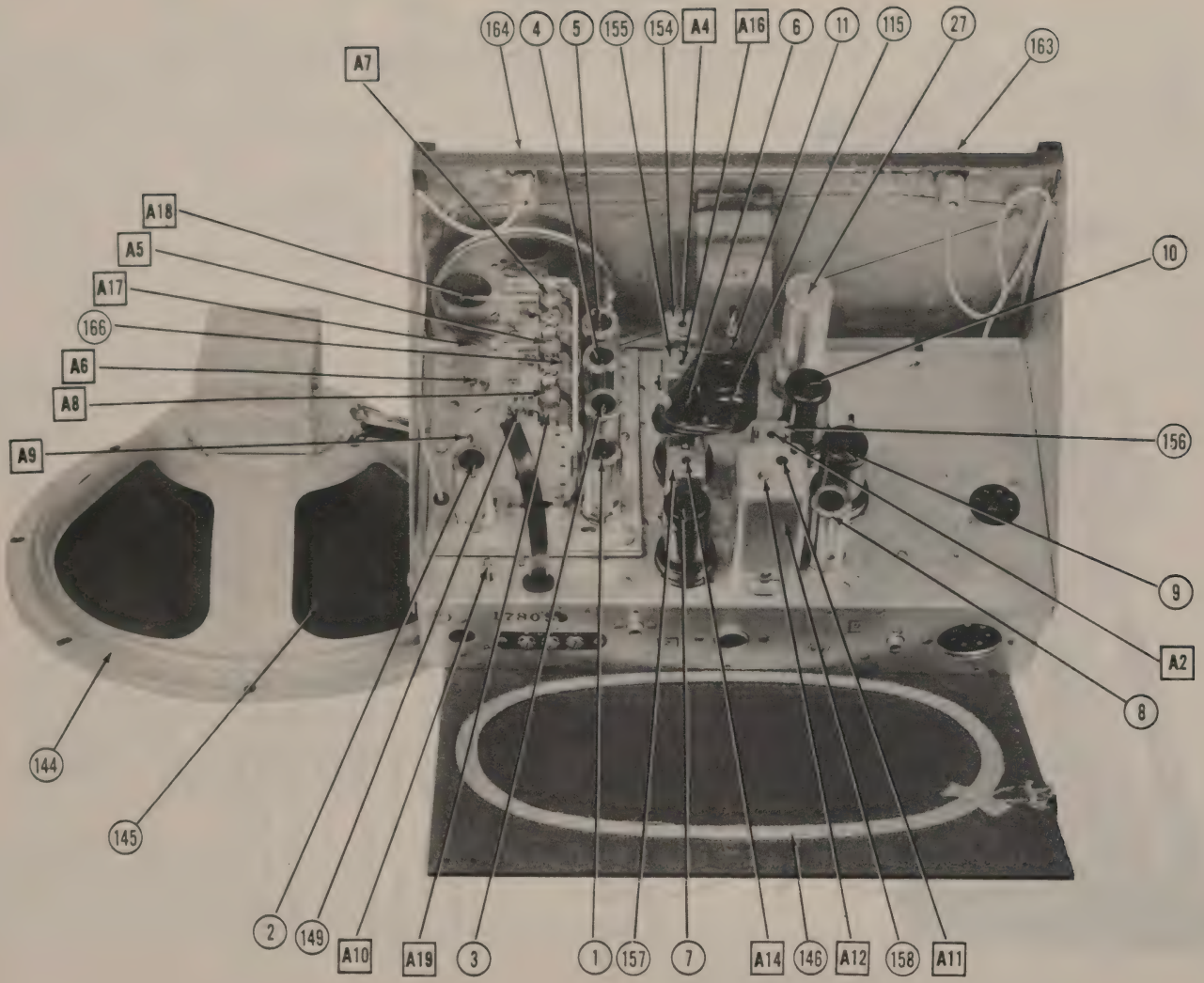
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# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

| ITEM No | USE | REPLACEMENT DATA ESPEY PART No. | REPLACEMENT DATA STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| 1 | FM RF Amp. | 6AK | 6AK | 7PK | |
| 2 | AM RF Amp. | 6BA | 6BA | 7BK | |
| 3 | FM [illegible] | 6C4 | 6C4 | 5BG | |
| 4 | FM Mixer | 6BE | 6BE | 7CH | |
| 5 | AM Converter | 6BE | 6BE | 7CH | |
| 6 | 1st IF Amp. | 6SK7 | 6SK7 | 7CK | |
| 7 | FM 2nd IF Amp. | 6SK7 | 6SK7 | 7CK | |
| 8 | FM Detector | 6AL5 | 6AL5 | 6BT | |
| 9 | AM Det.-AVC | 6J6 | 6J6 | 6Q | |
| 10 | AF Amp. | 6SC7 | 6SC7 | 6Q | |
| 11 | Tuning Ind. | 6U5/6G5 | 6U5/6G5 | 6R | |
| 12 | AF Amp. | 6J6 | 6J6 | 6Q | |
| 13 | Phase Inverter | 6J6 | 6J6 | 6Q | |
| 14 | Power Output | 6V6GT | 6V6GT | 7AC | |
| 15 | Power Output | 6V6GT | 6V6GT | 7AC | |
| 16 | Power Output | 6V6GT | 6V6GT | 7AC | |
| 17 | Power Output | 6V6GT | 6V6GT | 7AC | |
| [illegible] | Rectifier | 5Y3GT | 5Y3GT | 5T | |
| [illegible] | Rectifier | 5Y3GT | 5Y3GT | 5T | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING CAP. | RATING VOLT | REPLACEMENT DATA ESPEY PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| 20A | 40 | 450 | C13.806 | AF88J | UP4445 | | DY-2x40-450 | EL-240 | ▲ Filter |
| B | 40 | 450 | | | | | | | ▲ Filter |
| 21A | 40 | 450 | C13.806 | AF88J | UP4445 | | DY-2x40-450 | EL-240 | ▲ Filter |
| B | 40 | 450 | | | | | | | ▲ Filter |
| 22 | 25 | 25 | | PRS25/25 | BR252A | | M-25-25 | TA-25 | Cathode Bypass |
| [illegible] | [illegible] | [illegible] | | PRS25/25 | BR252A | | M-25-25 | TA-25 | " " |
| 24 | 25 | 25 | | PRS25/25 | BR252A | | M-25-25 | TA-25 | " " |
| 25 | 5 | 250 | N25.206 | PRS250/4 | BR425 | | M-4-450 | UT-42 | Stabilizing Cap. |
| 26 | 8 | 450 | | PRS450/8 | BR845 | | M-8-450 | UT-8 | Decoup. See Note 2 |
| 27A | 20 | 450 | N25.225 | AF44J | UP2245 | | DY-2x20-450 | EL-220 | ▲ Decoupling |
| B | 20 | 450 | | | | | | | ■ Decoupling |
| 28 | .05 | 400 | | 484-05 | GT4S5 | | MPH-4-05 | TM-15 | Line Filter |
| 29 | .05 | 400 | | 484-05 | GT4S5 | | MPH-4-05 | TM-15 | " " |
| 30 | .002 | 1200 | | 1684-002 | GT16D2 | | STM-16-002 | TR-22 | Tone Compensation |
| 31 | .002 | 1200 | | 1684-002 | GT16D2 | | STM-16-002 | TR-22 | " " |
| 32 | .05 | 400 | | 484-05 | GT4S5 | | ST-4-05 | TM-15 | Audio Coupling |
| 33 | .05 | 400 | | 484-05 | GT4S5 | | ST-4-05 | TM-15 | " " |
| 34 | .01 | 600 | | 684-01 | GT6S1 | CP2-335-01 | ST-6-01 | TM-11 | " " |
| 35 | .05 | 200 | | 484-05 | GT2S5 | | ST-4-05 | TM-15 | " " |
| 36 | .005 | 400 | | 484-005 | GT6D5 | GP2M-005 | ST-6-005 | TM-25 | Tone Compensation |
| 37 | .02 | 200 | | 484-02 | GT2S2 | | ST-4-02 | TM-12 | " " |
| 38 | .05 | 200 | | 484-05 | GT2S5 | | ST-4-05 | TM-15 | Audio Coupling |
| 39 | .05 | 400 | | 484-05 | GT4S5 | | ST-4-05 | TM-15 | RF Bypass Power Supply |
| 40 | .5 | 200 | | 484-5 | GT2P5 | | ST-2-5 | TM-5 | Bias Filter |
| 41 | .05 | 200 | | 484-05 | GT2S5 | | ST-4-05 | TM-15 | AVC Filter |
| 42 | .05 | 400 | | 484-05 | GT4S5 | | ST-4-05 | TM-15 | Conv. Screen Bypass |
| 43 | .05 | 400 | | 484-05 | GT4S5 | | ST-4-05 | TM-15 | RF Screen Bypass |
| 44 | .02 | 200 | | 484-02 | GT2S2 | | ST-4-02 | TM-12 | Cathode Bypass |
| 45 | 250 | 500 | | 1468-00025 | 5W5T25 | GP2K-250 | MO.5-325 | 1FM-325 | Tone Compensation |
| 46 | 250 | 500 | | 1468-00025 | 5W5T25 | GP2K-250 | MO.5-325 | 1FM-325 | 1st AF Plate Bypass |
| 47 | 2000 | 300 | | 1467-002 | 1W5D2 | GP2M-002 | MW.5-22 | 1FM-22 | AVC Filter |
| 48 | 250 | 500 | | 1468-00025 | 5W5T25 | GP2K-250 | MO.5-325 | 1FM-325 | FM Det. Diode Load Cap. |
| 49 | 3000 | 300 | | 1467-003 | 1W5D3 | GP2M-003 | MW.5-23 | 1FM-23 | De-emphasis |
| 50 | 2000 | 300 | | 1467-002 | 1W5D2 | GP2M-002 | MW.5-22 | 1FM-22 | RF Bypass Power Supply |
| 51 | 2000 | 300 | | 1467-002 | 1W5D2 | GP2M-002 | MW.5-22 | 1FM-22 | 2nd IF Plate Decoup. |

# PARTS LIST AND DESCRIPTIONS (Continued)

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA ESPEY PART No. | REPLACEMENT DATA IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| 98 | 1000Ω | ½ | | BTS-1000 | Br.-Blk.-Red. FM Mixer Plate Decoupling. |
| 99 | 2 Meg. | ½ | | BTS-2.2 Meg. | Red-Blk.-Grn. AVC Net. |
| 100 | 2 Meg. | ½ | | BTS-2.2 Meg. | Red-Blk.-Grn. " " " |
| 101 | 2000Ω | ½ | | BTS-2200 | Red-Blk.-Red. 1st IF Decoupling. |
| 102 | 68Ω | ½ | | | Blue-Gray-Blk. " " Cathode. |
| 103 | 50KΩ | ½ | | BTS-47K | Diode Filter. See note. |
| 104 | 470KΩ | ½ | | BTS-470K | Yl.-Vi.-Yl. " Load. |
| 105 | 220KΩ | ½ | | BTS-220K | Red-Red-Yl. 2nd IF Grid. |
| 106 | 68Ω | ½ | | | Blue-Gray-Blk. " " Cathode. |
| 107 | 22KΩ | 1 | | BTA-22K | Red-Red-Or. " " Screen. |
| 108 | 1000Ω | ½ | | BTS-1000 | Br.-Blk.-Red. " " Plate Decoupling. |
| 109 | 470KΩ | ½ | | BTS-470K | Yl.-Vi.-Yl. AVC Network. |
| 110 | 220KΩ | ½ | | BTS-220K | Red-Red-Yl. " " |
| 111 | 22KΩ | ½ | | BTS-22K | Red-Red-Or. De-emphasis. |
| 112 | 10KΩ | ½ | | BTS-10K | Br.-Blk.-Or. Ratio Detector Diode Load. |
| 113 | 10KΩ | ½ | | BTS-10K | Br.-Blk.-Or. " " " " |
| 114 | 10KΩ | ½ | | BTS-10K | Br.-Blk.-Or. Tone Compensation. |
| 115 | 1 Meg. | ½ | | BTS-1 Meg. | Br.-Blk.-Grn. Tuning Indicator Plate Load. |
| 116 | 10 Meg. | ½ | | BTS-10 Meg. | Br.-Blk.-Blue. 1st AF Grid. |
| 117 | 220KΩ | ½ | | BTS-220K | Red-Red-Yl. " " Plate Load. |
| 118 | 47KΩ | ½ | | BTS-47K | Yl.-Vi.-Or. " " " Decoupling. |
| 119 | 270KΩ | ½ | | BTS-270K | Red-Blue-Yl. Bias Network. |
| 120 | 10KΩ | ½ | | BTS-10K | Br.-Blk.-Or. " " |
| 121 | 470KΩ | ½ | | BTS-470K | Yl.-Vi.-Yl. " " |
| 122 | 470KΩ | ½ | | BTS-470K | Yl.-Vi.-Yl. 2nd AF Grid. |
| 123 | 4700Ω | ½ | | BTS-4700 | Yl.-Vi.-Red. " " " |
| 124 | 10Ω | ½ | | BW-½-10 | Br.-Blk.-Blk. 2nd AF Cathode. |
| 125 | 220KΩ | ½ | | BTS-220K | Red-Red-Yl. " " Plate Load. |
| 126 | 47KΩ | ½ | | BTS-47K | Yl.-Vi.-Or. Phase Inverter Grid. |
| 127 | 4700Ω | ½ | | BTS-4700 | Yl.-Vi.-Red. " " Cathode. |
| 128 | 220KΩ | ½ | | BTS-220K | Red-Red-Yl. " " Plate Load. |
| 129 | 100KΩ | ½ | | BTS-150K | Br.-Blue-Yl. Output Grid. |
| 130 | 220KΩ | ½ | | BTS-220K | Red-Red-Yl. " " |
| 131 | 130Ω | 5 | N14.089 | | " Cathode. |
| 132 | 39Ω | ½ | | BW-½-39 | Or.-White-Blk. Parasitic Suppressor. |
| 133 | 39Ω | ½ | | BW-½-39 | Or.-White-Blk. " " |
| 134 | 39Ω | ½ | | BW-½-39 | Or.-White-Blk. " " |
| 135 | 39Ω | ½ | | BW-½-39 | Or.-White-Blk. " " |
| 136 | 4000Ω | 10 | | AB-4000 | Tone Compensation. |
| 137 | 4000Ω | 10 | | AB-4000 | " " |
| 138 | 100Ω | ½ | | BW-½-100 | Br.-Blk.-Br. Feed back. |
| 139 | 2200Ω | 2 | | DG-2250 | Screen Dropping. |
| 140 | 47KΩ | ½ | | BTS-47K | Yl.-Vi.-Or. Decoupling. |
| 141 | 1000Ω | 14 | | DG-1000 | Filter. |

Note: Items 103,55A & B are combined into one unit.

## TRANSFORMER (POWER)

| ITEM No. | RATING PRI. | RATING SEC. 1 | RATING SEC. 2 | RATING SEC. 3 | REPLACEMENT DATA ESPEY PART No. | REPLACEMENT DATA STANCOR PART No. | REPLACEMENT DATA CHICAGO PART No. | REPLACEMENT DATA MERIT PART No. |
|---|---|---|---|---|---|---|---|---|
| 142 | 117 VAC | 570 VCT @ 1.25A | 5.0 VAC @ 4.0A | 6.4VAC .19 ADC | B18.077 | P-6165 * # | PH-200*# | P-2955 *# |
| | | | | 5.55A | | | | |

#Drill new mounting holes
*Add series resistor to reduce plate voltage.

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING IMPEDANCE PRI. | RATING IMPEDANCE SEC. | RATING DC RES. PRI. | RATING DC RES. SEC. | REPLACEMENT DATA ESPEY PART No. | REPLACEMENT DATA STANCOR PART No. | REPLACEMENT DATA CHICAGO PART No. | REPLACEMENT DATA MERIT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| 143 | 5000Ω CT | 500Ω<br>250Ω<br>15Ω<br>8Ω<br>4Ω | 360Ω CT | 21.5Ω<br>13.6Ω<br>1.2Ω<br>.9Ω<br>.6Ω | B15.037 | A-3800 # | PCO-80# | A-3131 | # Drill new mounting holes. |

# PARTS LIST AND DESCRIPTIONS (Continued)

| ITEM No. | RATING CAP. | RATING VOLT | REPLACEMENT DATA ESPEY PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| 82 | 3000 | 300 | | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | 2nd IF Screen Bypass |
| 83 | 3000 | 300 | | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | 2nd IF Cathode Bypass |
| 84 | 2000 | 300 | | 1467-002 | 1W5D2 | GP2M-002 | MW.5-22 | 1FM-22 | 2nd IF Grid Filter |
| 84A | 100 | 300 | | 1468-0001 | 5W5T1 | GP1K-100 | MO.5-31 | 1FM-31 | RF Diode Filter Note 1 |
| [illegible] | 100 | 300 | | 1468-0001 | 5W5T1 | GP1K-100 | MO.5-31 | 1FM-31 | RF Diode Filter Note 1 |
| 86 | 10000 | 300 | | 1467-01 | 1D3S1 | GP2-335-01 | MW.3-11 | 1FM-11 | 1st IF Screen Bypass |
| 87 | 10000 | 300 | | 1467-01 | 1D3S1 | GP2-335-01 | MW.3-11 | 1FM-11 | 1st IF Cathode Bypass |
| 88 | 2000 | 300 | | 1467-002 | 1W5D2 | GP2M-002 | MW.5-22 | 1FM-22 | RF Bypass Power Sup. |
| 89 | 2000 | 300 | | 1467-002 | 1W5D2 | GP2M-002 | MW.5-22 | 1FM-22 | Conv. Plate Decoup. |
| 90 | 100 | 500 | | 1468-0001 | 5W5T1 | GP1K-100 | MO.5-31 | 1FM-31 | Osc. Grid Cap. |
| 91 | 15 | 500 | | | | | | MS-415 | Fixed Trimmer |
| 92 | 5 | 500 | | 1468-000005 | 5R5V5 | NP0K-5 | MOS.5-55 | MS-55 | " " |
| 93 | 1500 | 300 | | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | Mixer Screen Bypass |
| 94 | 1500 | 300 | | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | Mixer Cathode Bypass |
| 95 | 2 | 500 | | | | | | | Mixer Grid Cap. |
| 96 | 100 | 300 | | 1468-0001 | 5W5T1 | GP2K-300 | MO.5-31 | 1FM-31 | RF Bypass Note 2 |
| 97 | 1500 | 300 | | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | RF Bypass |
| 98 | 20 | 300 | N25.220 | | 5R5Q2 | NP0K-20 | MOS.5-42 | MS-42 | Osc. Feedback |
| 99 | 40 | 500 | | 1468-00004 | 5W5Q4 | GP1K-50 | MO.5-44 | 1FM-44 | Osc. Grid Cap. |
| 100 | 40 | 500 | | 1468-00004 | 5W5Q4 | GP1K-50 | MO.5-44 | 1FM-44 | RF Coupling |
| 71A | 1500 | 300 | N25.211 | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | RF Screen Bypass |
| [illegible] | 1500 | 300 | | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | Cathode Bypass |
| [illegible] | 1500 | 300 | | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | RF Bypass Power Supply |
| 72 | 1500 | 300 | | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | RF Coupling |
| 73 | 1500 | 300 | | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | AVC Filter |
| 74 | 500 | 300 | | 1468-0005 | 5W5T5 | GP2K-500 | MO.5-35 | 1FM-35 | RF Coupling |
| 75 | 500 | 300 | | 1468-0005 | 5W5T5 | GP2K-500 | MO.5-35 | 1FM-35 | Filament Bypass |
| 76 | 0.05 | 300 | | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | " " |
| 77 | 500 | 300 | | 1468-0005 | 5W5T5 | GP2K-500 | MO.5-35 | 1FM-35 | " " Note 2 |
| 78 | 500 | 300 | | 1468-0005 | 5W5T5 | GP2K-500 | MO.5-35 | 1FM-35 | " " |
| 79 | 500 | 300 | | 1468-0005 | 5W5T5 | GP2K-500 | MO.5-35 | 1FM-35 | " " |

Note 1. Items 55A, 55B and 103 are combined into one unit.
Note 2. Not used in all models.

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA ESPEY PART No. | IRC PART No. | CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| 80A | 100KΩ | ½ | A9.127 | D13-133X | T-78 | Volume Control tapped @ 100KΩ. |
| 80B | Shaft | | Not req. | A | Not req. | Attach to 80A per instructions. |
| 81A | 1 Meg. | ½ | A9.129 | D11-137 | M-61-S | Bass Control. |
| 81B | Shaft | | Not req. | A | Not req. | Attach to 81A per instructions. |
| 82A | 1 Meg. | ½ | A9.128 | D13-137 | M-63-Z | Treble Control. |
| 82B | Shaft | | Not req. | A | Not req. | Attach to 82A per instructions. |
| 82C | Switch | | " " | 41 | SW-A | " " " |

## RESISTORS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA ESPEY PART No. | IRC PART No. | IDENTIFICATION CODES | |
|---|---|---|---|---|---|---|
| 83 | 1000Ω | ½ | | BTS-1000 | Br.-Blk.-Red. | Antenna Loading. |
| 84 | 470KΩ | ½ | | BTS-470K | Yl.-Vi.-Yl. | AM RF Grid. |
| 85 | 100Ω | ½ | | | Br.-Blk.-Br. | " " Cathode. |
| 86 | 22KΩ | ½ | | BTS-22K | Red-Red-Or. | " " Screen. |
| 87 | 150Ω | ½ | | | Br.-Grn.-Br. | Parasitic Suppressor. |
| 88 | 22KΩ | ½ | | BTS-22K | Red-Red-Or. | AM Oscillator Grid. |
| 89 | 15KΩ | 2 | | BT-2-15K | Br.-Grn.-Or. | " Converter Screen. |
| 90 | 470KΩ | ½ | | BTS-470K | Yl.-Vi.-Yl. | FM RF Grid. |
| 91 | 68Ω | ½ | | | Blue-Gray-Blk. | " " Cathode. |
| 92 | 22KΩ | ½ | | BTS-22K | Red-Red-Or. | " " Screen. |
| 93 | 22KΩ | ½ | | BTS-22K | Red-Red-Or. | " Mixer Injector Grid. |
| 94 | 150Ω | ½ | | | Br.-Grn.-Br. | " " Cathode. |
| 95 | 15KΩ | 2 | | BT-2-15K | Br.-Grn.-Or. | " " Screen. |
| 96 | 47KΩ | ½ | | BTS-47K | Yl.-Vi.-Or. | " Oscillator Grid. |
| 97 | 1000Ω | ½ | | BTS-1000 | Br.-Blk.-Red. | " " Plate Decoup. |

DATE 6/49 4911-8 SET #63 FOLDER 8

# PARTS LIST AND DESCRIPTIONS (Continued)

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA ESPEY PART No. | JENSEN PART No. | QUAM PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | FIELD | V.C. IMP. | | ST-102 | | |
| 144 | PM | 7.5Ω | N11.072 | MOD.P12-S | 12A6 | |
| | CONE DIA. | V.C. DIA. | | | | |
| 145 | 11 1/2" | 1 1/4 | | | | |

## R F COILS

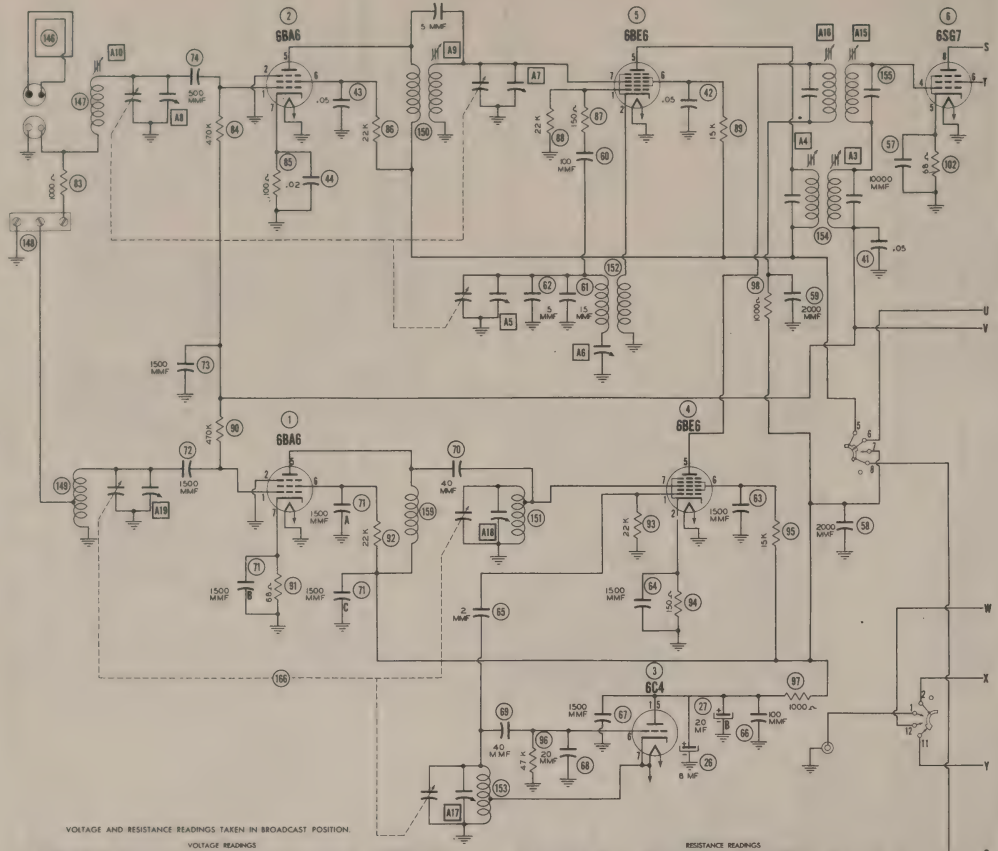
| ITEM No. | USE | DC RES. PRI. | DC RES. SEC. | REPLACEMENT DATA ESPEY PART No. | REPLACEMENT DATA MEISSNER PART No. |
|---|---|---|---|---|---|
| 146 | AM Loop Ant. | | .8Ω | C5.027 | |
| 147 | AM Ant.Load Coil. | | 2Ω | B2.423 | |
| 148 | FM Dipole Ant. | | 0Ω | A5.010 | |
| 149 | FM Ant.Coil | | 0Ω | N2.411 | |
| 150 | AM RF Coil | 90Ω | 3.4Ω | B2.409 | |
| 151 | FM RF Coil | | 0Ω | N2.412 | |
| 152 | AM Osc.Coil | 3Ω | 7Ω | A2.410 | 14-1060 |
| 153 | FM Osc.Coil | | 0Ω | N2.413 | |
| 154 | AM 1st IF | 10Ω | 10Ω | N2.414 | 16-6678 |
| 155 | FM 1st IF | 1Ω | 1Ω | N2.415 | |
| 156 | AM 2nd IF | 10Ω | 10Ω | N2.414 | 16-6678 |
| 157 | FM 2nd IF | 1Ω | 1Ω | N2.415 | |
| 158 | Ratio Det. | 1Ω | .5Ω | C2.278 | |
| 159 | RF Plate chk | | 1.5Ω | A2.402 | |
| 160 | Fil. Choke | | .5Ω | N2.416 | |
| 161 | Fil.Choke | | .5Ω | N2.416 | |
| 162 | Fil.Choke | | .5Ω | N2.439 | |

## DIAL LIGHT

| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA ESPEY PART No. | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
| 163 | Bayonet | 6-8V | 0.15A | Brown | | | Type # 47 |
| 164 | " | 6-8V | 0.15A | " | | | " 47 |

## MISCELLANEOUS

| ITEM No. | PART NAME | ESPEY PART No. | NOTES |
|---|---|---|---|
| 165 | Switch | A12.102 | Band |
| 166 | 3 Gang Var.Cap. | B6.070 | (40-537 MMF, 40-533MMF, 24-517 MMF) |
| A6 | Padder | C13518 | BC Osc. Adjustment. |
| A17 | Trimmer | N20.022 | FM Osc. Adjustment. |
| A18 | Trimmer | N20.020 | FM RF Adjustment. |




VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION.

VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| #1 | 6BA6 | -1.1VDC | 0V | 6.4VAC | 0V | 220VDC | 125VDC | 1.1VDC | |
| 2 | 6BA6 | -1.1VDC | 0V | 0V | 6.4VAC | 245VDC | 125VDC | 1.1VDC | |
| #3 | 6C4 | 0VDC | 0V | 6.4VAC | 0V | 205VDC | 5-6.7VDC | 0V | |
| #4 | 6BE6 | -1.1VDC | 0V | 6.4VAC | 0V | 220VDC | 80VDC | 0V | |
| 5 | 6BE6 | -1.1VDC | 0V | 6.4VAC | 0V | 245VDC | 115VDC | 0V | |
| 6 | 6BA7 | 0V | 0V | 0VDC | -21VDC | -7VDC | 245VDC | 6.4VAC | 210VDC |
| #7 | 6BA7 | 0V | 0V | 0VDC | -1VDC | 1VDC | 130VDC | 6.4VAC | 210VDC |
| #8 | 6AL5 | -1.1VDC | 0V | 0V | 6.4VAC | 0-55VDC | 0V | 1.2VDC | |
| 9 | 6AL5 | -1.1VDC | 0V | 0V | -2V | 0V | 0V | 6.4VAC | 0V |
| 10 | 6N7 | 0V | -1.1VDC | 0V | -1.1VDC | -.45VDC | 245VDC | -.4VAC | 0V |
| 11 | 6U5/6G5 | | | | | | | | |
| 12 | 6J5 | 0V | 0V | 0VDC | 195VDC | 0V | 0V | 6.4VAC | -6.7VDC |
| 13 | 6J5 | 0V | 0V | 0VDC | 195VDC | 0V | 0V | 6.4VAC | 12.8VDC |
| 14 | 6V6GT | 0V | 0V | 0VDC | 270VDC | 0V | 0V | 6.4VAC | 17VDC |
| 15 | 6V6GT | 0V | 0V | 0VDC | 260VDC | 0V | 0V | 6.4VAC | 17VDC |
| 16 | 6V6GT | 0V | 0V | 0VDC | 270VDC | 0V | 0V | 6.4VAC | 17VDC |
| 17 | 6V6GT | 0V | 0V | 0VDC | 265VDC | 0V | 0V | 6.4VAC | 17VDC |
| 18 | 6X4 | 0V | 0V | 0VDC | 0V | 280VAC | 0V | 280VAC | |
| 19 | 6X5GT | 0V | 0V | 0VDC | 0V | 285VAC | 0V | 285VAC | 280VDC |

TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| #1 | 6BA6 | 1 Meg. | 0Ω | .1Ω | 0Ω | 61KΩ | 73KΩ | 68Ω | |
| 2 | 6BA6 | 3.5 Meg. | 0Ω | 0Ω | .1Ω | 61KΩ | 73KΩ | 100Ω | |
| #3 | 6C4 | 56KΩ | Inf. | .1Ω | 0Ω | 52KΩ | 47KΩ | 0Ω | |
| #4 | 6BE6 | 68KΩ | 1Ω | .1Ω | 0Ω | 50KΩ | 66KΩ | 0Ω | |
| 5 | 6BE6 | 68KΩ | 1Ω | .1Ω | 0Ω | 51KΩ | 66KΩ | 66KΩ | |
| 6 | 6BA7 | 0Ω | 0Ω | 68Ω | 3 Meg. | 68Ω | 56KΩ | 1Ω | 55KΩ |
| #7 | 6BA7 | 0Ω | 0Ω | 68Ω | 220KΩ | 68Ω | 73KΩ | 1Ω | 55KΩ |
| #8 | 6AL5 | 440KΩ | 440KΩ | 0Ω | 1Ω | Inf. | 0Ω | Inf. | |
| 9 | 6AL5 | 0Ω | 0Ω | 0Ω | Inf. | 500KΩ | Inf. | 1Ω | 0Ω |
| 10 | 6N7 | 0Ω | 1.0 Meg. | 0Ω | 580KΩ | 580KΩ | 320KΩ | 1Ω | 0Ω |
| 11 | 6U5/6G5 | | | | | | | | |
| 12 | 6J5 | 0Ω | 0Ω | 320KΩ | 100KΩ | 47KΩ | 0Ω | 1Ω | 4.7KΩ |
| 13 | 6J5 | Inf. | 0Ω | 100KΩ | 100KΩ | 47KΩ | Inf. | 1Ω | 4.7KΩ |
| 14 | 6V6GT | 0Ω | 0Ω | 50KΩ | 50KΩ | 210KΩ | 210KΩ | 1Ω | 12KΩ |
| 15 | 6V6GT | 0Ω | 0Ω | 50KΩ | 50KΩ | 210KΩ | 210KΩ | 1Ω | 12KΩ |
| 16 | 6V6GT | 0Ω | 0Ω | 50KΩ | 50KΩ | 210KΩ | 210KΩ | 1Ω | 12KΩ |
| 17 | 6V6GT | 0Ω | 0Ω | 50KΩ | 50KΩ | 210KΩ | 210KΩ | 1Ω | 12KΩ |
| 18 | 6X4 | 0Ω | 0Ω | 50KΩ | Inf. | 50Ω | Inf. | 30Ω | Inf. |
| 19 | 6X5GT | 0Ω | 0Ω | 50KΩ | Inf. | 22Ω | Inf. | 22Ω | Inf. |

† VOLTAGE AND RESISTANCE READINGS TAKEN IN PM POSITION.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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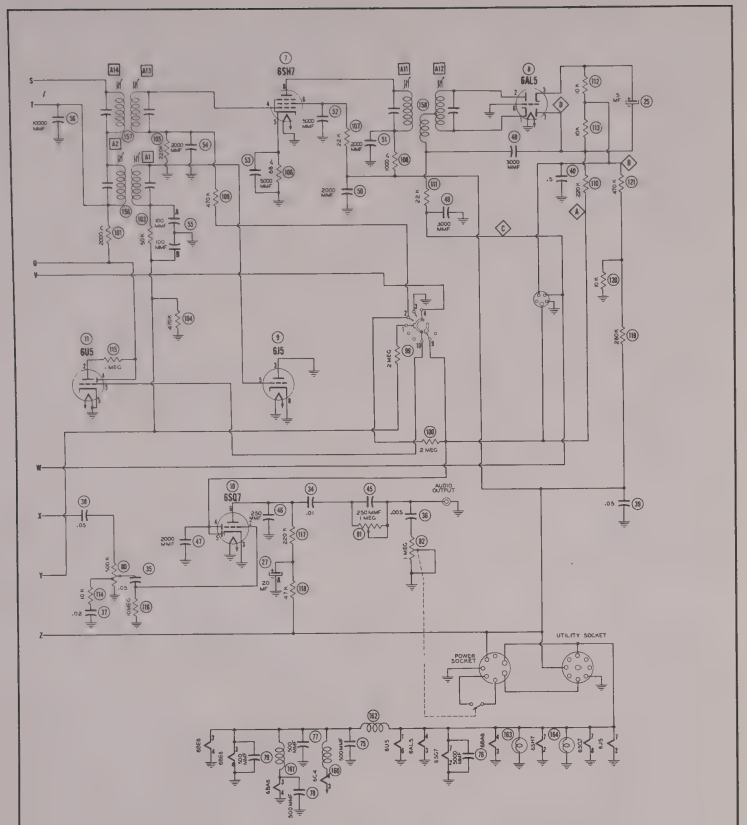


IF=455KC AM

IF=10.7 MC FM

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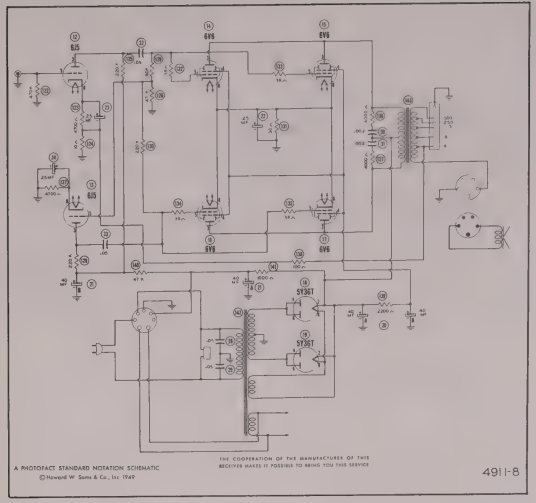


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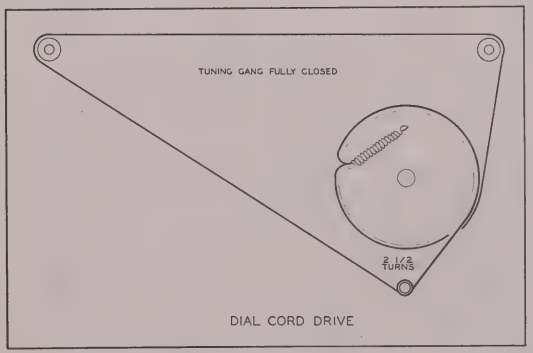
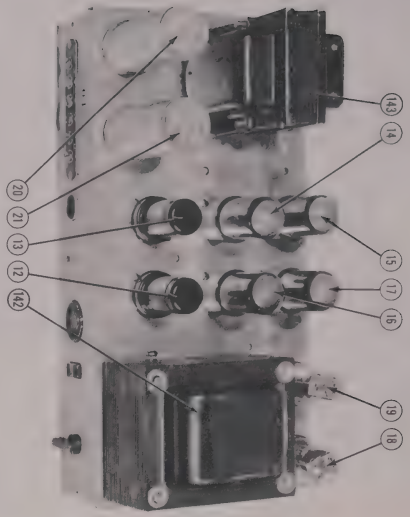



DIAL CORD DRIVE




**ALIGNMENT INSTRUCTIONS--READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT**

To set pointer turn tuning cap. fully closed and set pointer to last reference mark at low frequency end of dial.
Attenuate output of signal generator to maintain output meter reading of .5 watt.

**AM ALIGNMENT**

Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

| DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1 | .05MFD | High side to pin 4(Grid) of 6BG7. Low side to chassis. | 455KC | AM (Clockwise). | Tuning cap. fully open. | Across voice coil | A1,A2 | Adjust for maximum output. |
| 2 | .05MFD | High side to front AM stator of tuning cap. Low side to chassis. | 455KC | " | " | " | A3,A4 | Adjust for maximum output. |
| 3 | 50MMFD | High side to external AM ant. terminal. Low side to chassis. | 1720KC | " | " | " | A5 | Adjust for maximum output. |
| 4 | 50MMFD | " | 535KC | " | Tuning cap. fully closed. | " | A6 | Adjust for maximum output. Repeat steps 3 and 4. |
| 5 | 50MMFD | " | 1640KC | " | Tune for maximum output. | " | A7,A8 | Adjust for maximum output. |
| 6 | 50MMFD | " | 600KC | " | " | " | A9,A10 | Adjust for maximum output. Repeat steps 5 & 6 until no further improvement can be made. |

**FM IF ALIGNMENT USING AM SIGNAL GENERATOR VTVM AND OUTPUT METER**

| DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 7 | .01MFD | High side to pin 4(Grid) of 6SH7. Low side to chassis. | 10.7 MC (Unmod.) | FM | Tuning cap. fully open. | D.C. Probe to point A. Common to point B. | A11 | Adjust for maximum deflection. |
| 8 | .01MFD | " | 10.7 MC (Unmod.) | " | " | D.C. Probe to point A. Common to point B. | A12 | Adjust for zero deflection. Tune signal generator above and below 10.7 MC and note reading on VTVM. If these two readings are not equal, adjust A11 until they are equal. |

| DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 9 | .01MFD | High side to pin 4(Grid) of 6BG7. Low side to chassis. | 10.7 MC (400 mod. @ 30%) | FM | Tuning cap. fully open. | Across voice coil | A13, A14 | Solder a 1000Ω carbon resistor across primary of ratio detector transformer(158). Adjust A13 & A14 for maximum output. |
| 10 | .01MFD | High side to front FM stator cap. Low side to chassis. | 10.7 MC (400 mod. @ 30%). | " | " | " | A15, A16 | Adjust for maximum output. Remove 1000Ω shunting resistor. Continue with FM-RF alignment in step 11. |

**FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE**

Use frequency modulated signal with 0% modulation and 400 FM sweep. Use [illegible] equipment voltage in scope for horizontal deflection.

| DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | SCOPE CONNECT | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 7 | .01MFD | High side to pin 4(Grid) of 6SG7. Low side to chassis. | 10.7 MC (Freq.Mod) | FM | Tuning cap. fully open. | Vertical input to point A. Ground to chassis. | A11,A13 A14 | Disconnect 1000Ω cap. (R51 from point B. Adjust A11, also A14 for maximum amplitude, symmetry and coincidence of pattern per Fig. 1. |
| 8 | .01MFD | High side to pin 7(Grid) of 6BE6 FM mixer(4). Low side to chassis. | 10.7 MC (Freq.Mod) | " | " | " | A15,A16 | Adjust for maximum amplitude, symmetry and coincidence of pattern per Fig.1. |
| 9 | .01MFD | " | 10.7 MC (Freq.Mod) | " | " | Vertical input to point A. Ground to chassis. | A12 | Adjust for crossover of diagonal lines occurring at scope horizontal sweepline per Fig.2. Continue with FM-RF alignment in step 11. |

**FM RF ALIGNMENT**

| DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 11 | 270Ω Carbon resistor | High side to FM ant. terminal "A2". Low side to chassis. | 108.5 MC (Unmod.) | FM | Tuning cap. fully open. | D.C. Probe to point A. Common to point B. | A17 | Adjust for maximum deflection. |
| 12 | 270Ω Carbon resistor | " | 87.5 MC (Unmod.) | " | Tuning cap. fully closed. | " | FM Osc. coil. (153) | Expand or compress coil slightly for maximum deflection. Repeat steps 11 & 12 until no further improvement can be made. |
| 13 | 270Ω Carbon resistor | " | 108MC (Unmod.) | " | Tune for maximum deflection. | " | A18,A19 | Rock tuning cap. and adjust for maximum deflection. |
| 14 | 270Ω Carbon resistor | " | 88 MC (Unmod.) | " | " | " | FM RF coil (151) & FM ant. coil (149). | Expand or compress coil slightly for maximum deflection. Repeat steps 13 & 14 until no further improvement can be made. |

FIG. 1

FIG. 2

PHOTOFACT* Folder

# GENERAL ELECTRIC
# MODEL 811

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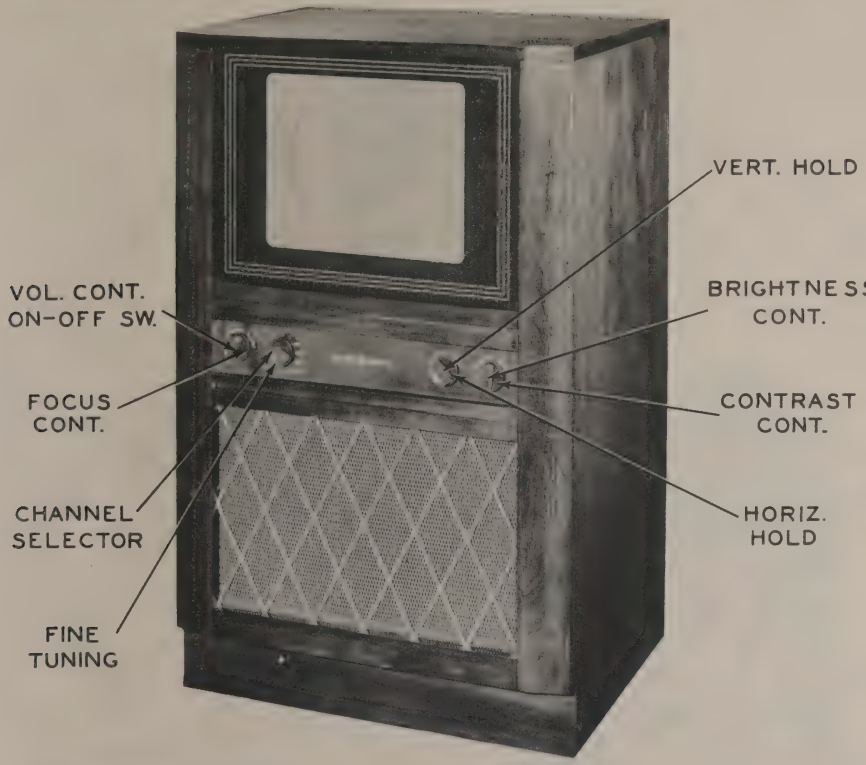


GENERAL ELECTRIC MODEL 811

| | |
|---|---|
| **TRADE NAME** | General Electric Model 811 |
| **MANUFACTURER** | General Electric Co., Electronics Dept., Electronic Park, Syracuse, New York |
| **TYPE SET** | Television Receiver |
| **TUBES** | Twenty-Two |
| **POWER SUPPLY** | 117 Volts, 60 Cycles AC RATING: 2.1 Amps @ 117 Volts |
| **TUNING RANGE**– | Channels 2 through 13 |

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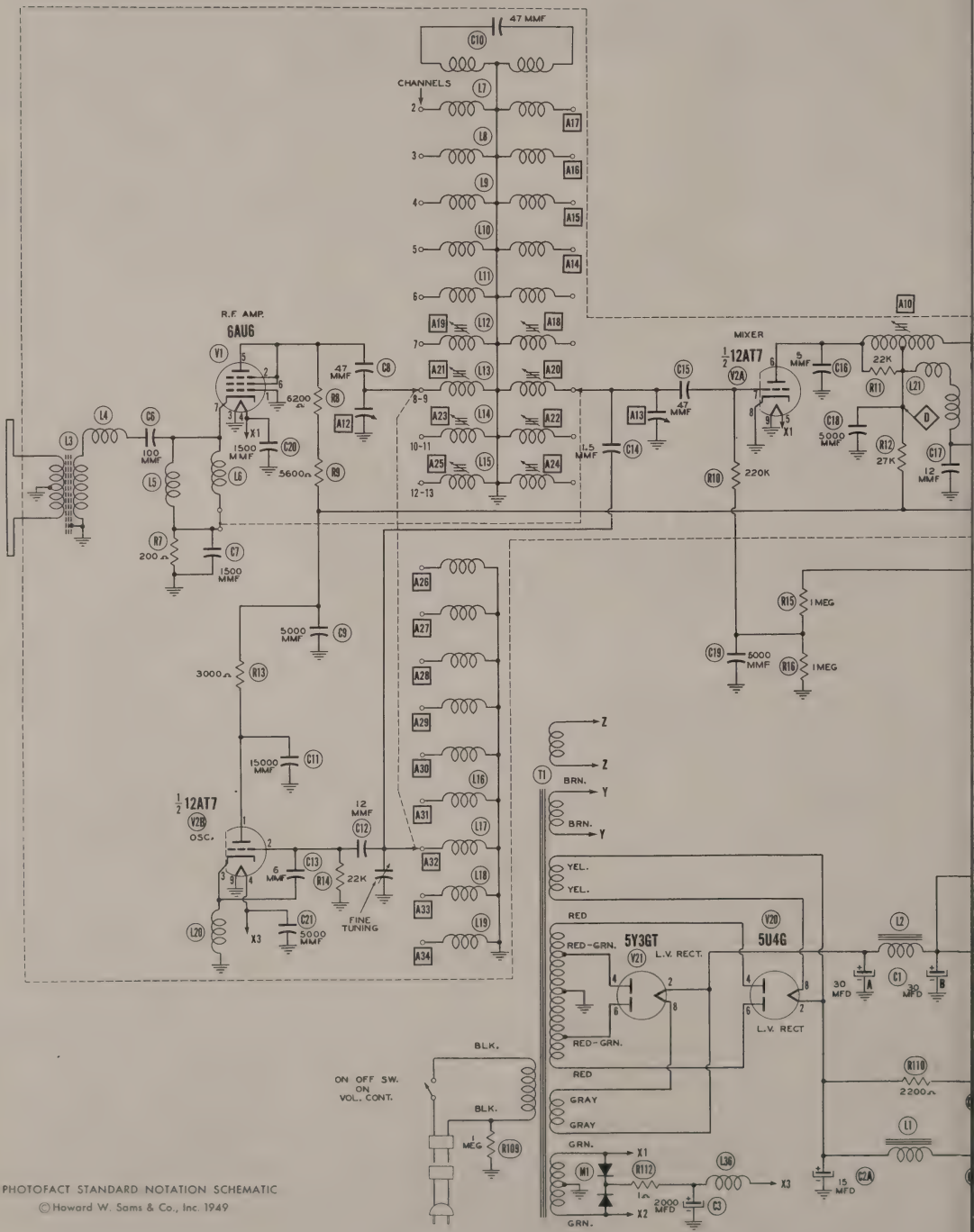
DATE 6/49 4911-9 SET #63 FOLDER 9

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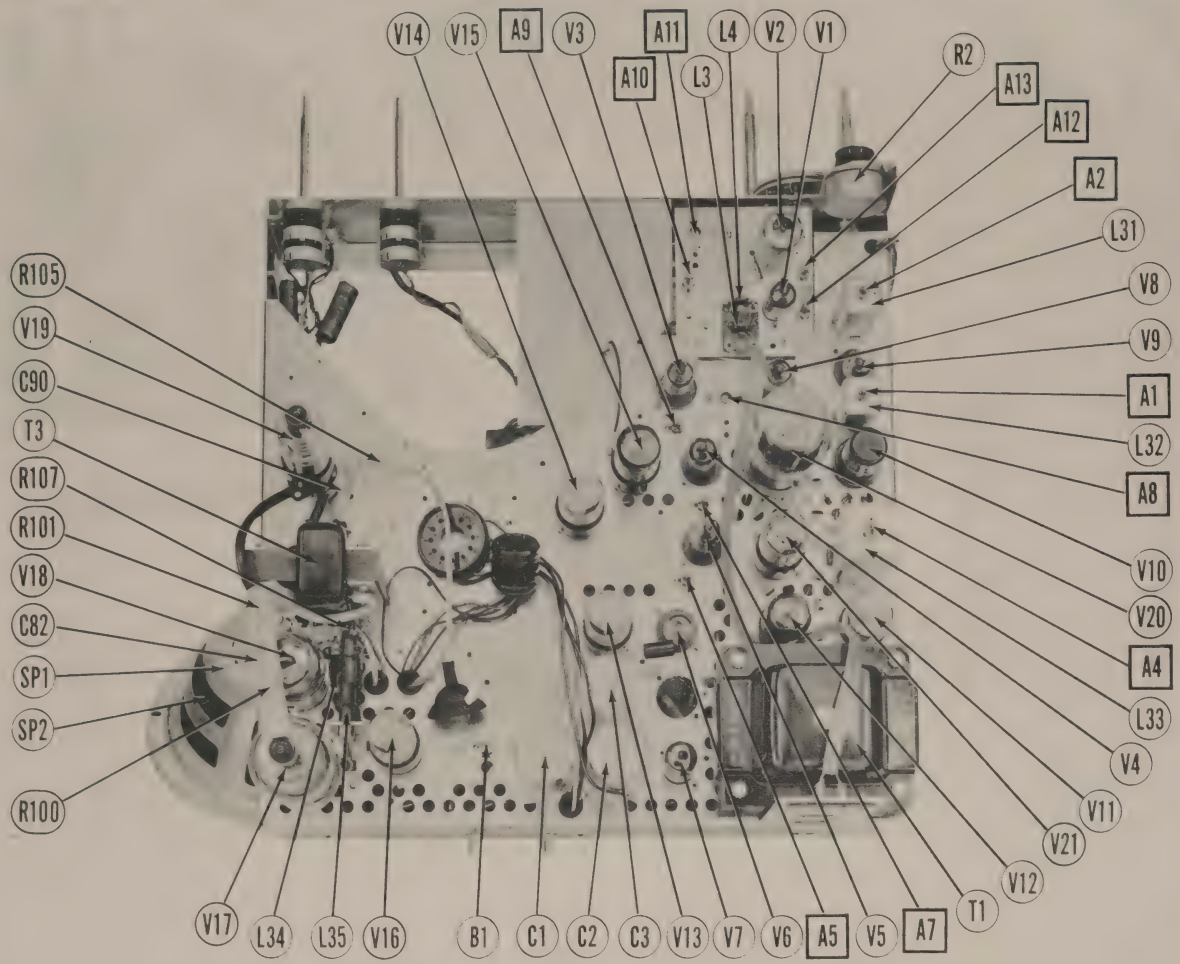
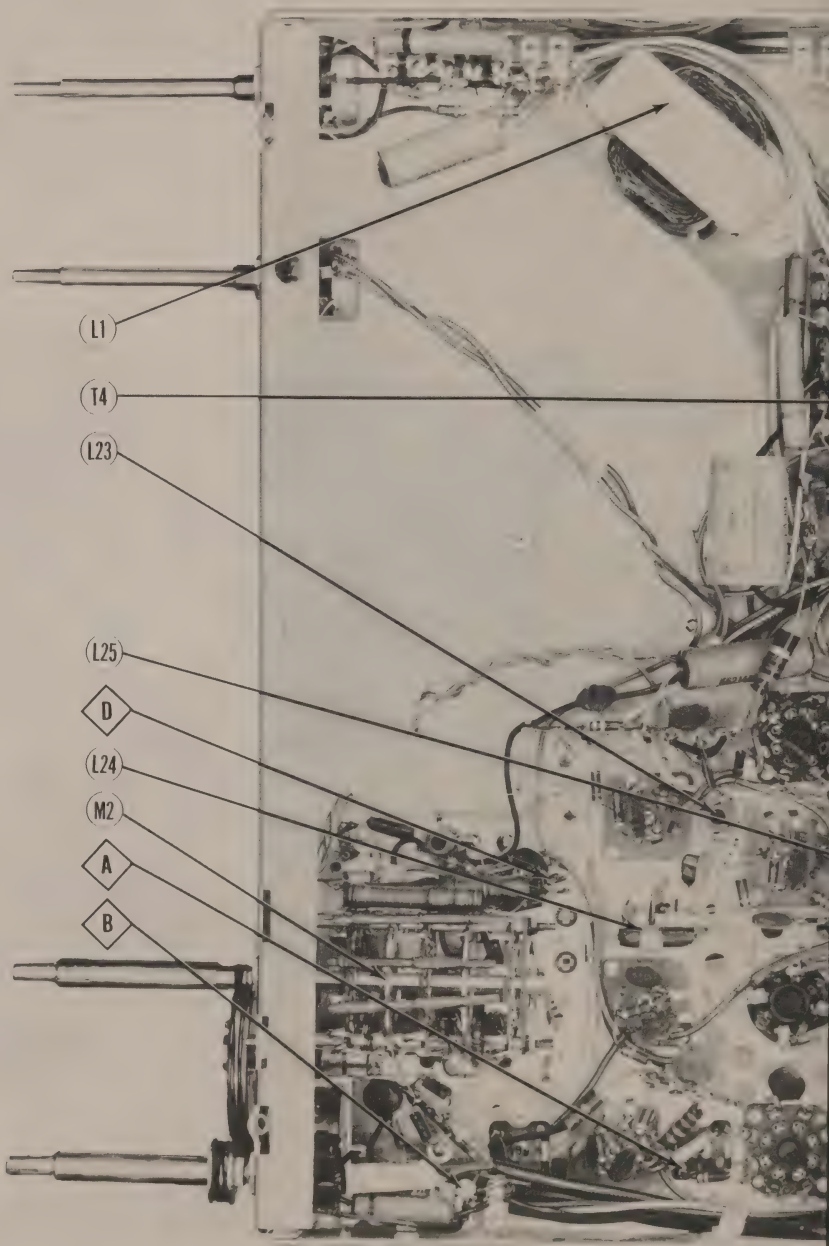
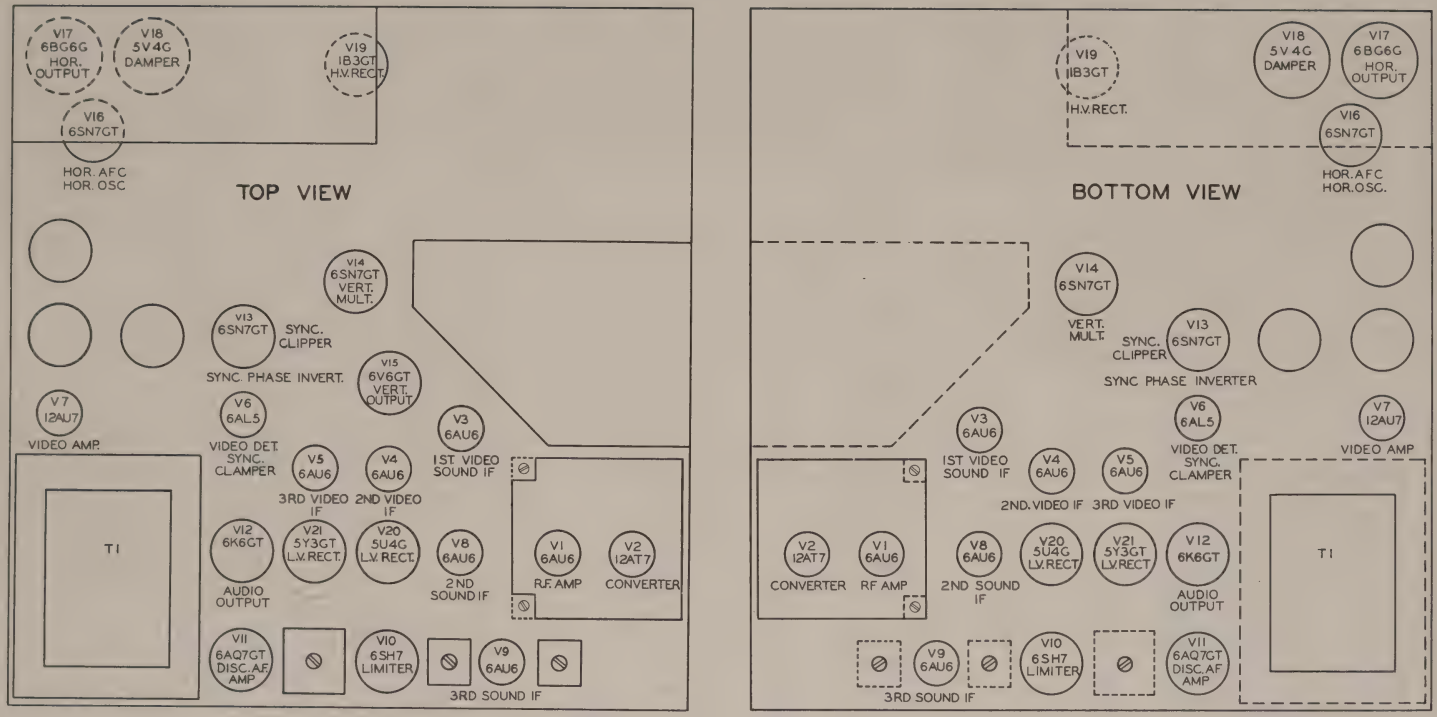



CHASSIS TOP VIEW




CHASSIS BOTTOM VIEW-TRANS., INDU




TUBE PLACEMENT CHART

# ALIGNMENT INSTRUCTIONS

## PRE-ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

### SOUND IF ALIGNMENT

High voltage may be disabled during alignment by removing V14.
Keep signal generator output low enough to give a 3/4 volt maximum peak reading.
Contrast control should be set to give -4 volt bias reading.
The signal generator lead should be terminated with a resistor equal to the impedance of the generator then connected with as short a lead as possible through a 500 MMF capacitor. Connect ground lead to chassis at the closest possible point.
When aligning the Video IF, the tube preceding the one to which signal is applied should be removed. If this is not done, the previous coil will act as a trap and cause considerable change in the response pattern.
If the response curve is peaked at the low frequency end and can not be connected by the slug, try changing the 6AU6 into which the signal is fed. Abnormally high plate capacity can cause this difficulty.
Use insulated alignment tool for adjustments.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1 | 500 MMF. | Pin #1 (grid) of 6AU6 (V9). | 21.8MC 1MC sweep | 21.8MC | 4 | High side to Point Ⓐ through 100KΩ resistor. Low side to chassis. | A1 | Adjust for maximum amplitude with marker at center of peak. See Fig. 1. |
| 2 | 500 MMF. | Pin #1 (grid) of 6AU6 (V8). | " | " | " | " | A2A, A2B | " |
| 3 | 500 MMF. | " | " | 21.8MC (400 ∿ Mod.) | " | High side to Point Ⓑ through 10KΩ resistor. Low side to chassis. | A3 | Adjust for symmetrical S curve. At proper frequency the modulation at the edges of the pattern will disappear. See Fig. 2. |
| 4 | 500 MMF. | " | " | " | " | " | A4 | Adjust for maximum amplitude and symmetry of S curve. Repeat Steps 3 and 4 for best results. |

### VIDEO IF ALIGNMENT

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 5 | 500 MMF | Pin #1 (grid) of 6AU6 (V5). | 25MC 10MC sweep | 22.9MC 26.3MC | 4 | High side to Point Ⓒ through 10KΩ resistor. Low side to chassis. | A5,A6 | Adjust for maximum amplitude with pattern as shown in Fig. 3. Remove V4 during this adjustment. |
| 6 | 500 MMF. | Pin #1 (t 1d) of 6AU6 (V4). | " | 22.9MC 25.55MC 26.3MC | " | " | A7 | Adjust for maximum amplitude with pattern as shown in Fig. 4. Remove V3 during this adjustment. |
| 7 | 500 MMF. | Pin #1 (grid) of 6AU6 (V3). | Not used | 21.8MC 400 ∿ (Mod.) | " | " | A8 | Adjust for minimum amplitude. |
| 8 | 500 MMF. | " | 25MC 10MC sweep | 22.9MC 23.4MC 25.55MC 26.3MC | " | " | A9 | Remove V2 during this step. Adjust for maximum amplitude with pattern as shown in Fig. 5. |
| 9 | 500 MMF. | Pin #7 (grid) of 12AT7. | " | " | " | " | A10 | Turn A11 to minimum. Adjust for maximum amplitude with pattern as shown in Fig. 5. |
| 10 | 500 MMF | " | " | " | " | " | A11 | Adjust for 26.3MC at half amplitude as shown in Fig. 6. |

### RF ALIGNMENT

Terminate signal generator lead with a carbon resistor equal to generator impedance, then connect to antenna terminals through two equal resistances to make total equal approximately 300 ohms.
DO NOT ATTEMPT TO ALIGN THE RF SECTION UNLESS IT IS DEFINITELY KNOWN TO BE NECESSARY. Usually alignment will not be necessary unless a coil has been damaged or replaced. Since separate coils are used for each switch position it should be necessary to re-align only the deflective channel. Adjustment of A12 and A13 may be necessary when tubes are replaced in the RF Tuner.
Adjustments are made by changing the inductance of the individual coils. Coupling is fixed except for channels #2 and #3. Coupling on channel #2 may be varied by sliding the copper rings on the coil form. Coupling on channel #3 may be adjusted if necessary by moving turns at the insides of the coils. Frequency adjustment is made in each case by expanding or compressing the coils. The upper three switch positions each cover two channels and must be sufficiently broad. The fine tuning control should be at center position during oscillator alignment.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 11 | Resistive (See above) | Antenna terminals. | 85MC 15MC sweep | 82.25MC 87.75MC | 6 | High side to Point Ⓓ. Low side to chassis. Disconnect C18. | A12,A13 | Adjust for maximum amplitude and flat response. See Fig. 7. |
| 12 | " | " | 75MC 15MC sweep | 77.25MC 81.75MC | 5 | " | A14 | " |
| 13 | " | " | 65MC 15MC sweep | 67.25MC 71.75MC | 4 | " | A15 | " |
| 14 | " | " | 63MC 15MC sweep | 61.25MC 65.75MC | 3 | " | A16 | " |
| 15 | " | " | 57MC 15MC sweep | 53.25MC 59.75MC | 2 | " | A17 | Adjust for maximum. See Fig. 8. |
| 16 | " | " | 177MC 15MC sweep | 175.25MC 179.75MC | 7 | " | A18,A19 | Adjust for maximum. See Fig. 7. Keep slugs approximately even. |
| 17 | " | " | 195.5MC 25MC sweep | 191.25MC 197.75MC | 8-9 | " | A20,A21 | Adjust for maximum. See Fig. 9. |
| 18 | " | " | 195.5MC 25MC sweep | 191.25MC 197.75MC | 10-11 | " | A22,A23 | " |
| 19 | " | " | 213.5MC 25MC sweep | 209.25MC 215.75MC | 12-13 | " | A24,A25 | " |

OSCILLATOR ALIGNMENT

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 20 | Resistive (see above) | Antenna terminals | 59.75MC (Modulated) | 2 | | A26 | Set volume control and tuning control at mid-position. Use sound output as indicator. Squeeze or spread turns to adjust. |
| 21 | " | " | 65.75MC (Modulated) | 3 | | A27 | " |
| 22 | " | " | 71.75MC (Modulated) | 4 | | A28 | " |
| 23 | " | " | 81.75MC (Modulated) | 5 | | A29 | " |
| 24 | " | " | 87.75MC (Modulated) | 6 | | A30 | " |
| 25 | " | " | 179.75MC (Modulated) | 7 | | A31 | " |
| 26 | " | " | 188.75MC (Modulated) | 8-9 | | A32 | " |
| 27 | " | " | 200.75MC (Modulated) | 10-11 | | A33 | " |
| 28 | " | " | 212.75 (Modulated) | 12-13 | | A34 | " |

FIG.1

FIG.2

FIG.3

FIG.4

FIG.5

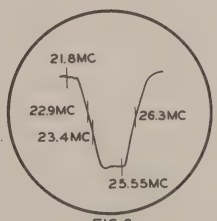


FIG.6

FIG.7

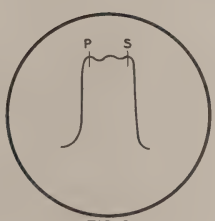


FIG.8

FIG.9

## HORIZONTAL FREQUENCY ADJUSTMENT

The horizontal frequency control is a coarse adjustment used to set the front panel horizontal hold control to obtain synchronization at approximately the center of its range. The core (B1) of the blocking oscillator transformer sets the natural frequency of the system.

Connect a VTVM to the junction of the contrast control and resistor R18. Tune in a television signal and adjust the front panel horizontal hold control to the center of its range. Alternately adjust the horizontal frequency control and slug B1 until synchronization is obtained with 12 volts indicated by the VTVM. The voltage must be within one volt of 12 volts at the correct adjustment.

The front panel horizontal hold control should cause the picture to fall out of synchronization at each end of its rotation.

# VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V 1 | 6AU6 | 0V | 1[illegible] VDC | 0V | 6.3VAC | 150VDC | 180VDC | 1.8VDC | | |
| V 2 | 12AT7 | 230VDC | §-6.4VDC | 0V | 6.8VDC | 6.3VAC | 160VDC | -6VDC | 0V | 0V |
| V 3 | 6AU6 | -.4VDC | 0V | 0V | 6.3VAC | 300VDC | 300VDC | .1VDC | | |
| V 4 | 6AU6 | -8.3VDC | 0V | 0V | 6.3VAC | 300VDC | 300VDC | 0V | | |
| V 5 | 6AU6 | -1.2VDC | 0V | 0V | 6.3VAC | 235VDC | 150VDC | 0V | | |
| V 6 | 6AL5 | 0V | -.8VDC | 6.3VAC | 0V | 0V | 0V | -.3VDC | | |
| V 7 | 12AU7 | 50VDC | -.6VDC | 0V | 0V | 0V | 175VDC | 0V | 2VDC | 6.3VAC |
| V 8 | 6AU6 | 0V | 0V | 0V | 6.3VAC | 120VDC | 110VDC | 1VDC | | |
| V 9 | 6AU6 | 0V | 0V | 0V | 6.3VAC | 170VDC | 70VDC | .8VDC | | |
| V 10 | 6SH7 | 0V | 0V | 0V | -.5VDC | 0V | 50VDC | 6.3VAC | 250VDC | |
| V 11 | 6AQ7GT | 0V | .7VDC | 3.4VDC | -.5VDC | 95VDC | 0V | 6.3VAC | 0V | |
| V 12 | 6K6GT | 0V | 0V | 330VDC | 245VDC | 0V | 18.5VDC | 6.3VAC | 18.5VDC | |
| V 13 | 6SN7GT | -.8VDC | 145VDC<br>260VDC | 5.5VDC | 0V | 180VDC | 6VDC | 0V | 6.3VAC | |
| V 14 | 6SN7GT | -.4VDC | 26VDC | 0V | -3.8VDC | 5.2VDC<br>9.4VDC | 0V | 0V | 6.3VAC | |
| V 15 | 6V6GT | 0V | 6.3VAC | 280VDC | 145VDC<br>260VDC | 5.2VDC<br>9.4VDC | -1.2VDC | 0V | 9.5VDC<br>17.5VDC | |
| V 16 | 6SN7GT | -65VDC | 195VDC | 0V | -40VDC | 45VDC | -35VDC | 0V | 6.3VAC | |
| V 17 | 6BG6G | 0V | 0V | 9.5VDC | -3.4VDC | -3.4VDC | 0V | 6.3VAC | 290VDC | TOP CAP<br>† |
| V 18 | 5V4G | 0V | 450VDC | 0V | 360VDC | 0V | 360VDC | 0V | 450VDC | |
| V 19 | 1B3GT | † DO NOT MEASURE | | | | | | | | |
| V 20 | 5U4G | 0V | 390VDC | 0V | 350VAC | 0V | 350VAC | 0V | 390VDC | |
| V 21 | 6Y6GT | 0V | 320VDC | 0V | 310VAC | 0V | 310VAC | 0V | 320VDC | |
| V 22 | 10BP4 | *235VDC | 180VDC | PIN 10<br>440VDC | PIN 11<br>245VDC | PIN 12<br>*235VDC | | | | |

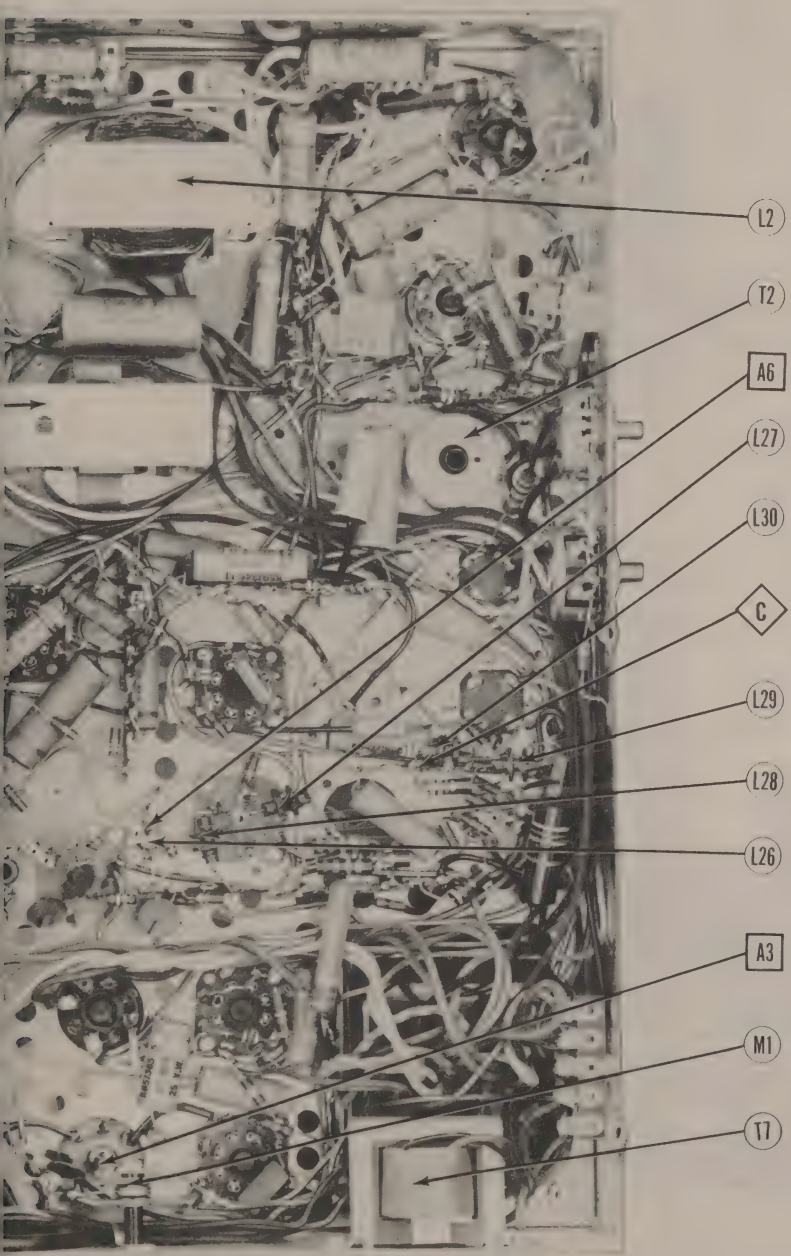
† Do not measure
* 6.3VAC measured between pins of socket.
§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

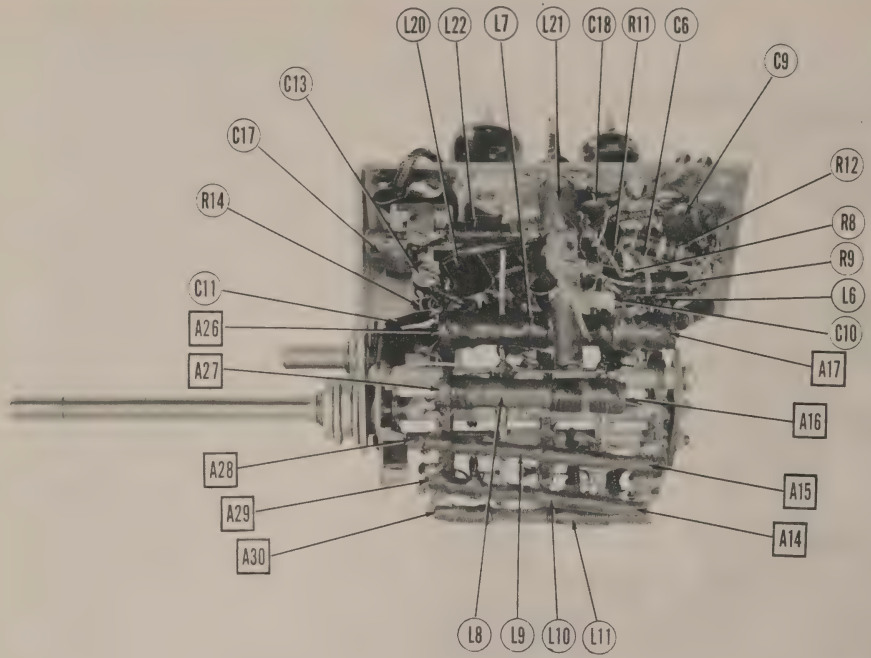
| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V 1 | 6AU6 | 0Ω | *12.5KΩ | 0Ω | .2Ω | *12.5KΩ | *12.5KΩ | 200Ω | | |
| V 2 | 12AT7 | *3.5KΩ | 22KΩ | 1.2Ω | .2Ω | .2Ω | *28KΩ | 750KΩ | 0Ω | 0Ω |
| V 3 | 6AU6 | 100KΩ | 0Ω | 0Ω | .2Ω | *1200Ω | *24KΩ | 47Ω | | |
| V 4 | 6AU6 | 180KΩ | 0Ω | 0Ω | .2Ω | *1200Ω | *24KΩ | 47Ω | | |
| V 5 | 6AU6 | 56KΩ | 0Ω | 0Ω | .2Ω | *2KΩ | *26KΩ | 0Ω | | |
| V 6 | 6AL5 | 0Ω | 3.9 Meg. | .2Ω | 0Ω | 0Ω | 0Ω | 5KΩ | | |
| V 7 | 12AU7 | †23KΩ | 1 Meg. | 0Ω | 0Ω | 0Ω | *5KΩ | 1 Meg. | 120Ω | .2Ω |
| V 8 | 6AU6 | 0Ω | 0Ω | 0Ω | .2Ω | *23KΩ | *60KΩ | 120Ω | | |
| V 9 | 6AU6 | .2Ω | 0Ω | 0Ω | .2Ω | *23KΩ | *150KΩ | 120Ω | | |
| V 10 | 6SH7 | 0Ω | 0Ω | 0Ω | 56KΩ | 0Ω | *220KΩ | .2Ω | *1500Ω | |
| V 11 | 6AQ7GT | .2Ω | 120KΩ | 240KΩ | 10 Meg. | *220KΩ | 0Ω | .2Ω | 0Ω | |
| V 12 | 6K6GT | Inf. | 0Ω | †2.8KΩ | *640Ω | 470KΩ | 750Ω | .2Ω | 750Ω | |
| V 13 | 6SN7GT | 3.9 Meg. | †25KΩ<br>†120KΩ | 6.5KΩ | 2.2 Meg. | *15KΩ | 1000Ω | 0Ω | .2Ω | |
| V 14 | 6SN7GT | 75KΩ | †220KΩ | 0Ω | 140KΩ | †2.2Meg. | 0Ω | 0Ω | .2Ω | |
| V 15 | 6V6GT | Inf. | .2Ω | *1800Ω | †128KΩ<br>†25KΩ | †2.2Meg. | 50KΩ | 0Ω | 1400Ω<br>420Ω | |
| V 16 | 6SN7GT | 160KΩ | ‡82KΩ | 0Ω | 1 Meg. | †42KΩ | 280KΩ | 0Ω | .2Ω | |
| V 17 | 6BG6G | Inf. | 0Ω | 82Ω | 1 Meg. | 1 Meg. | Inf. | .2Ω | ‡14KΩ | TOP CAP<br>‡100Ω |
| V 18 | 5V4G | Inf. | ‡0Ω | Inf. | †170Ω | Inf. | †170Ω | Inf. | ‡0Ω | |
| V 19 | 1B3GT | Inf. | Inf. | Inf. | Inf. | Inf. | Inf. | Inf. | Inf. | TOP CAP<br>‡470KΩ |
| V 20 | 5U4G | Inf. | 26KΩ | Inf. | 23Ω | Inf. | 24Ω | Inf. | 26KΩ | |
| V 21 | 6Y6GT | Inf. | 32KΩ | Inf. | 22Ω | Inf. | 20Ω | Inf. | 32KΩ | |
| V 22 | 10BP4 | 1.3 Meg. | *5KΩ | PIN 10<br>‡100KΩ | PIN 11<br>*290KΩ | PIN 12<br>1.3 Meg. | | | | |

* Measured from pin 2 of V21
† Measured from pin 8 of V20
‡ Measured from pin 8 of V18

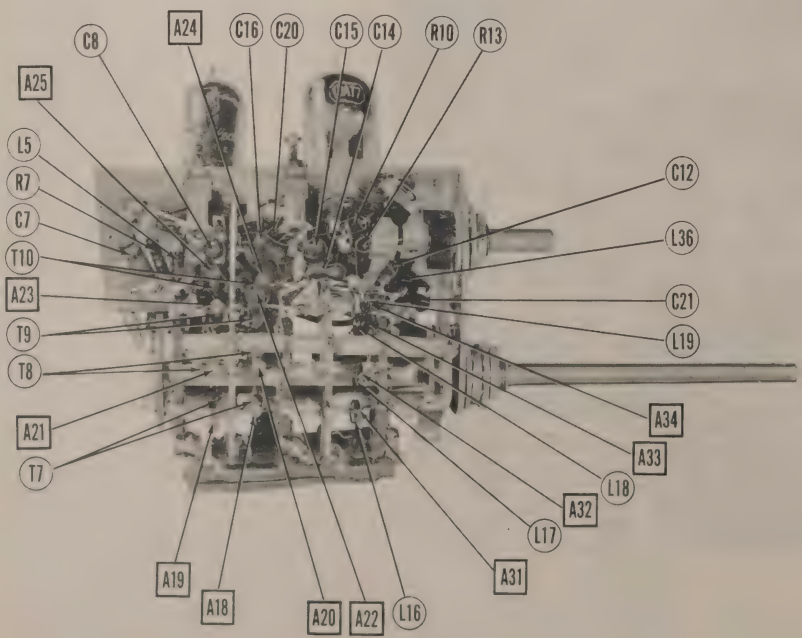
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



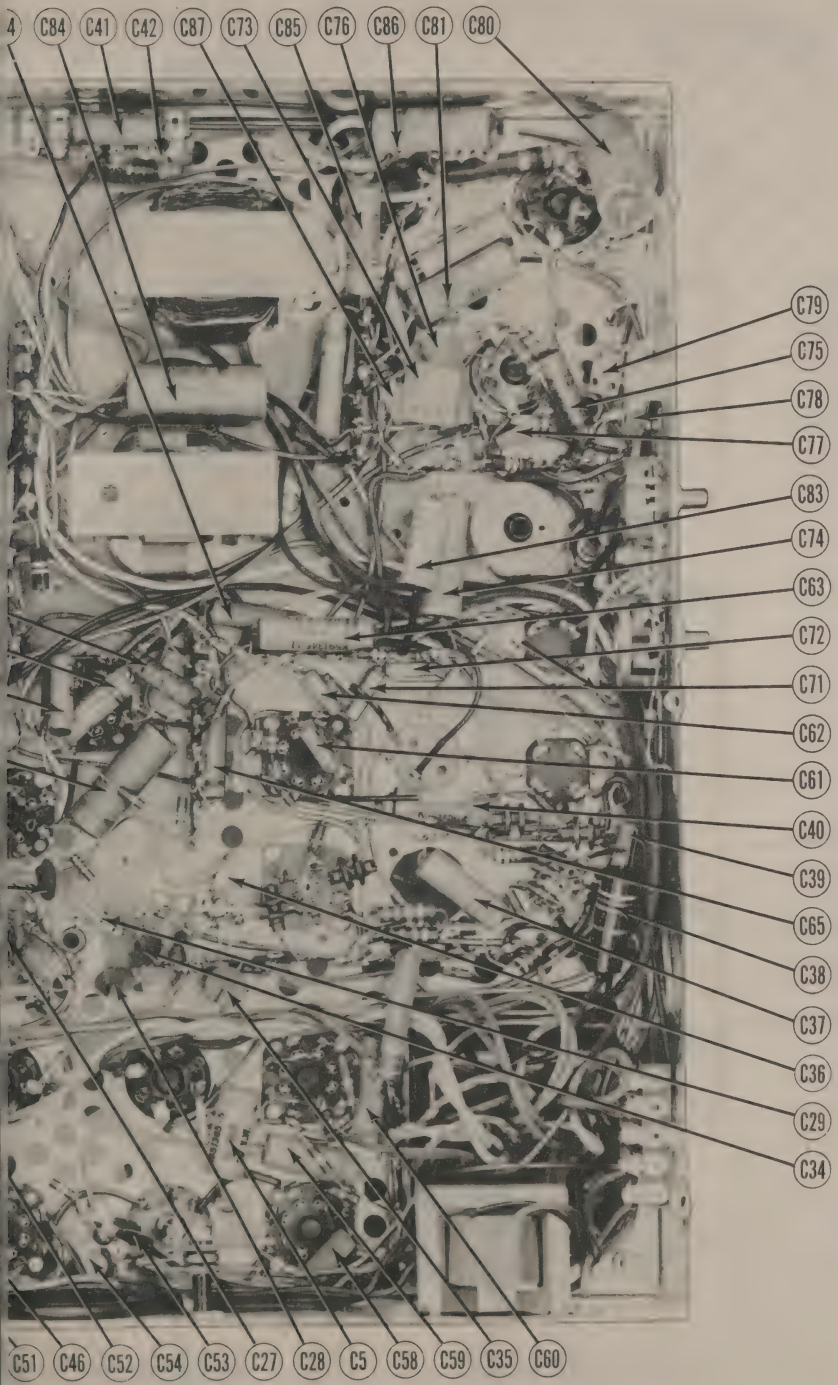

TOR AND ALIGNMENT IDENTIFICATION



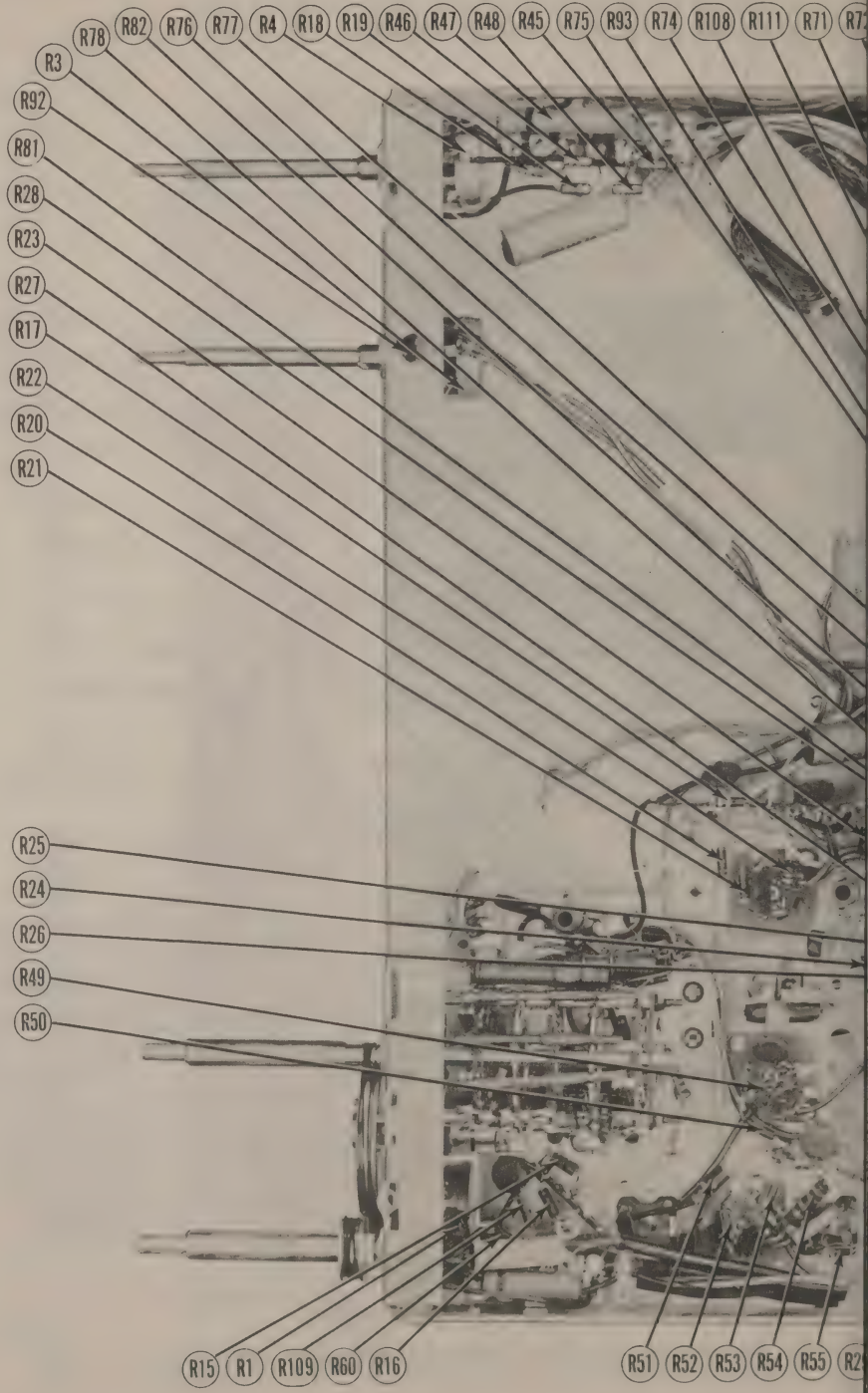

RF TUNER-RIGHT SIDE



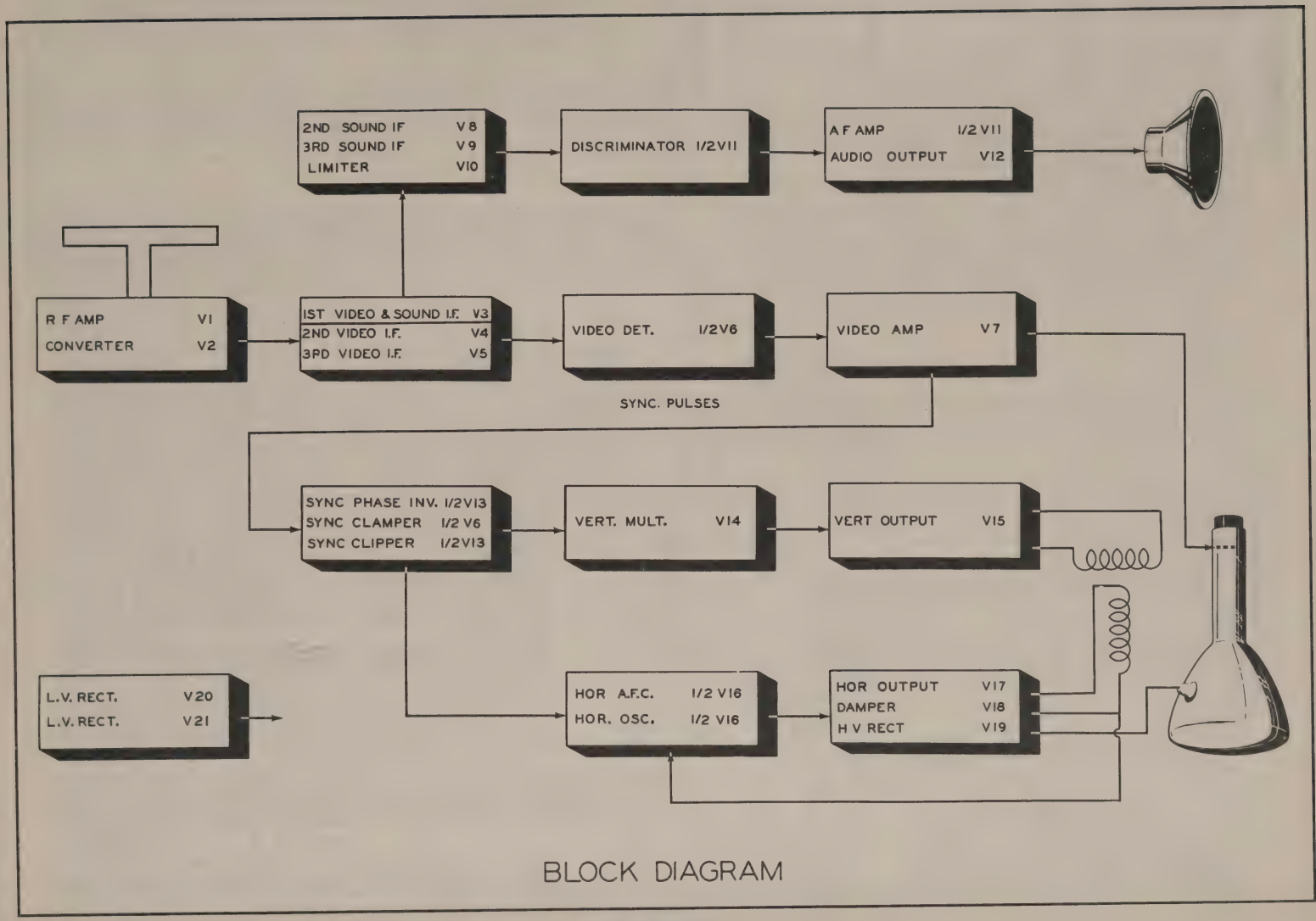

RF TUNER-LEFT SIDE




PACITOR IDENTIFICATION




CHASSIS BOTTOM VIEW




BLOCK DIAGRAM

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA | | RMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| | | G. E. PART No. | STANDARD REPLACEMENT | | |
| V1 | RF Amp. | 6AU6 | 6AU6 | 7 F | |
| V2 | Converter | 12AT7 | 12AT7 | | |
| V3 | 1st Video & Sound IF | 6AU6 | 6AU6 | 7 F | |
| V4 | 2nd Video IF | 6AU6 | 6AU6 | 7 F | |
| V5 | 3rd Video IF | 6AU6 | 6AU6 | 7 F | |
| V6 | Video Det.-Sync Clamper | 6AL5 | 6AL5 | 6 T | |
| V7 | Video Amp. | 12AU7 | 12AU7 | 9A | |
| V8 | 2nd Sound IF | 6AU6 | 6AU6 | 7 F | |
| V9 | 3rd Sound IF | 6AU6 | 6AU6 | 7 F | |
| V10 | Limiter | 6SH7 | 6SH7 | 8 F | |
| V11 | Disc.-AF Amp. | 6AQ7GT | 6AQ7GT | 9CK | |
| V12 | Audio Output | 6K6GT | 6K6GT | 7S | |
| V13 | Sync. Phase Inverter-Sync. Clipper | 6SN7GT | 6SN7GT | 8BD | |
| V14 | Vert. Mult. | 6SN7GT | 6SN7GT | 8BD | |
| V15 | Vert. Output | 6V6GT | 6V6GT | 7AC | |
| V16 | Hor. AFC-Hor. Oscillator | 6SN7GT | 6SN7GT | 8BD | |
| V17 | Hor. Output | 6BQ6G | 6BQ6G | 8T | |
| V18 | Damper | 5V4G | 5V4G | 5L | |
| V19 | HV Rect. | 1B3GT | 1B3GT | 3G | |
| V20 | LV Rect. | 5U4G | 5U4G | 5T | |
| V21 | LV Rect. | 5Y3GT | 5Y3GT | 5T | |
| V22 | Picture Tube | 10BP4 | 10BP4 | | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING CAP. | RATING VOLT | REPLACEMENT DATA G.E. PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | 30 | 450 | RCE-070 | AF862J4A | UP11DJ | | | | ▲ Filter |
| B | 30 | 450 | | PRS50/100 | 991 | | | | ■ Filter |
| C | 15 | 450 | | | | | | | ▲ Decoupling |
| D | 100 | 50 | | | | | | | Vert. Output Cath. Byp. |
| C2A | 15 | 450 | RCE-084 | AFH3666J | UP11DJ | | | | ▲ Filter |
| B | 30 | 450 | | | 1010 | | | | ■ Filter |
| C | 30 | 450 | | | | | | | ▲ Filter |
| D | 30 | 450 | | | | | | | Filter ↑ |
| C3 | 2000 | 6 | RCE-083 | PRS6/2000 | BRH-620 | | DY-2000-15 | TVL-43 | " |
| C4 | 20 | 450 | RCE-093 | PRS450/20 | BR2045 | | | TVA-22 | Vert. Output Plate Dec. |
| C5 | 25 | 25 | UCE-065 | PRS25/25 | BR252A | | | TVA-6 | Output Cath. Bypass |
| C6 | 100 | | RCW-1047 | 1468-0001 | 5W5T1 | GP1K-100 | MO.5-31 | 1FM-31 | RF Coupling |
| C7 | 1500 | | RCW-026 | | | GP2L-0015 | | | RF Cath. Bypass |
| C8 | 47 | | RCW-1052 | | | GP1K-50 | | | RF Coupling |
| C9 | 5000 | | RCW-3014 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | RF Bypass |
| C10 | 47 | | RCW-2010 | | | M75DL-47 | | | Fixed Trimmer |
| C11 | 1500 | | RCW- 026 | | | GP2L-0015 | | | Osc. Plate Bypass |
| C12 | 12 | | RCW-2006 | | | GP1K-15 | | | Osc. Grid Cap. |
| C13 | 6 | | RCW-2030 | | | | | | Osc. Feedback |
| C14 | 1.5 | | RCW-1045 | | | | | | Osc. Coupling |
| C15 | 47 | | RCW-1052 | | | GP1K-50 | | | RF Coupling |
| C16 | 5 | | RCW-2035 | | | NP0K-5 | | | Fixed Trimmer |
| C17 | 12 | 500 | UCU-1056 | | | | | | Fixed Padder |
| C18 | 5000 | | RCW-3014 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | Conv. Plate Decoupling |
| C19 | 5000 | | RCW-3014 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | Bias Filter |
| C20 | 1500 | | RCW-026 | | | GP2L-0015 | | | RF F11. Bypass |
| C21 | 5000 | | RCW-3014 | | | | | | Osc. Fil. Bypass |
| C22 | 100 | | RCW-1047 | 1468-0001 | 5W5T1 | GP1K-100 | MO.5-31 | 1FM-31 | IF Coupling |
| C23 | 5000 | | RCW-3014 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | 1st V. IF Screen Byp. |
| C24 | 5000 | | RCW-3014 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | 1st V. IF Plate Decoup. |
| C25 | 100 | | RCW-1047 | 1468-0001 | 5W5T1 | GP1K-100 | MO.5-31 | 1FM-31 | IF Coupling |
| C26 | 2.5 | | RCW-3017 | | | | | | S. IF Coupling |
| C27 | 5000 | | RCW-3014 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | 2nd V. IF Screen Byp. |
| C28 | 5000 | | RCW-3014 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | 2nd V. IF Plate Dec. |
| C29 | 100 | | RCW-1047 | 1468-0001 | 5W5T1 | GP1K-100 | MO.5-31 | 1FM-31 | IF Coupling |
| C30 | 5000 | | RCW-3014 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | Bias Filter |
| C31 | 5000 | | RCW-3014 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | " |
| C32 | 5000 | | RCW-3014 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | RF Bypass |
| C33 | 5000 | | RCW-3014 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | Bias Filter |
| C34 | 5000 | | RCW-3014 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | 3rd V. IF Screen Byp. |
| C35 | 5000 | | RCW-3014 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | 3rd V. IF Plate Dec. |
| C36 | 6 | | RCW-1002 | | | | | | IF Coupling |
| C37 | .05 | 200 | UCC-635 | P288-05 | GT2S5 | | ST-4-05 | TM-15 | Video Coupling |
| C38 | .047 | 600 | RCN-014 | P688-047 | GT6S5 | | ST-6-05 | TM-15 | " |
| C39 | 390 | 500 | UCU-1542 | 1468-0004 | 5W5T4 | GP2K-500 | MO.5 -34 | 1FM-34 | V. Amp. Cath. Byp. |
| C40 | .05 | 600 | UCC-635 | P688-05 | GT6S5 | | ST-6-05 | TM-15 | Sync. Coupling |
| C41 | .02 | 600 | UCC-631 | P688-02 | GT6S2 | | ST-6-02 | TM-12 | Retrace Blanking Coup. |
| C42 | .05 | 400 | UCC-635 | P488-05 | GT4S5 | | ST-4-05 | TM-15 | Voltage Divider |
| C43 | .2 | 200 | UCC-014 | P438-22 | GT4P2 | | ST-4-2 | TC-2 | Brightness Cont. Byp. |
| C44 | 5000 | | RCW-3014 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | 2nd S. IF Cath. Byp. |
| C45 | 5000 | | RCW-3014 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | 2nd S. IF Screen Byp. |
| C46 | 5000 | | RCW-3014 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | 2nd S. IF Plate Dec. |
| C47 | 5000 | | RCW-3014 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | 3rd S. IF Cath. Bypass |
| C48 | 5000 | | RCW-3014 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | 3rd S. IF Screen Byp. |
| C49 | 5000 | | RCW-3014 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | RF Bypass |
| C50 | 100 | 500 | UCU-1528 | 1468-0001 | 5W5T1 | GP1K-100 | MO.5-31 | 1FM-31 | IF Coupling |
| C51 | 47 | | RCW-1047 | 1468-00005 | 5W5Q5 | GP1K-50 | MO.5-45 | 1FM-45 | Limiter Grid Filter |
| C52 | 5000 | | RCW-3014 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | Limiter Screen Bypass |
| C53 | 5000 | | RCW-3014 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | Limiter Plate Dec. |
| C54 | 150 | 500 | UCU-1532 | 1468-00015 | 5W5T15 | GP2K-150 | MO.5-315 | 1FM-315 | De-emphasis |
| C55 | .01 | 200 | UCC-630 | P488-01 | GT2S1 | GP2-335-01 | ST-4-01 | TM-11 | Audio Coupling |
| C56 | .01 | 200 | UCC-630 | P488-01 | GT2S1 | GP2-335-01 | ST-4-01 | TM-11 | Tone Comp. |
| C57 | .02 | 200 | UCC-631 | P488-02 | GT2S2 | | ST-4-02 | TM-12 | Audio Coupling |
| C58 | 390 | 500 | UCU-1542 | 1468-0004 | 5W5T4 | GP2K-300 | MO.5-34 | 1FM-34 | AF Plate Bypass |
| C59 | .01 | 600 | UCC-630 | P688-01 | GT6S1 | GP2-335-01 | ST-6-01 | TM-11 | Audio Coupling |
| C60 | .005 | 600 | UCC-625 | P688-005 | GT6D5 | | ST-6-005 | TM-25 | Output Plate Bypass |
| C61 | 100 | 500 | UCU-1528 | 1468-0001 | 5W5T1 | GP1K-100 | MO.5-31 | 1FM-31 | Sync. Coupling |
| C62 | 390 | 500 | UCU-1542 | 1468-0004 | 5W5T4 | GP2K-500 | MO.5-34 | 1FM-34 | Sync. Clipper Cath. Byp. |
| C63 | .1 | 4 | UCC-635 | P438-05 | GT6S5 | | ST-4-05 | TM-15 | Integrator Net. |

## CAPACIT

| ITEM No. | RATING CAP. | RATING VOLT | REPLACEMENT DATA G.E. PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | P |
|---|---|---|---|---|---|---|
| C64 | .01 | 400 | UCC-630 | P488-01 | GT4S1 | GF2 |
| C65 | .01 | 400 | UCC-630 | P488-01 | GT4S1 | GF2 |
| C66 | .001 | 400 | UCC-620 | P488-001 | GT4S1 | GF2 |
| C67 | .002 | 600 | UCC-621 | P688-002 | GT6S2 | GF2 |
| C68 | .05 | 600 | RCC-065 | C64-06 | | |
| C69 | .001 | 400 | UCC-620 | P488-001 | GT4D1 | GF2 |
| C70 | .1 | 600 | UCC-640 | P688-1 | GT6H1 | |
| C71 | 120 | 500 | UCC-1530 | | | |
| C72 | 120 | 500 | UCC-1530 | | | |
| C73 | 2200 | 500 | UCU-2530 | 1467-002 | 1W5D2 | |
| C74 | .2 | 200 | UCC-014 | P488-22 | GT4P2 | |
| C75 | .002 | 200 | UCC-021 | P488-002 | GT4S2 | GF2 |
| C76 | .05 | 600 | UCC-635 | P688-05 | GT6S5 | |
| C77 | 135 | 500 | UCU-2534 | | | |
| C78 | 2200 | 500 | UCU-2530 | | | |
| C79 | 300 | 500 | UCU-1542 | 1468-0004 | 5W5T4 | |
| C80 | .5 | 200 | RCC-016 | P288-5 | GT2P5 | |
| C81 | .1 | 600 | UCC-640 | P688-1 | GT6H1 | |
| C82 | .0022 | 1000 | RCN-019 | | | |
| C83 | .01 | 600 | UCC-630 | P688-01 | GT6S1 | GF2 |
| C84 | .5 | 200 | RCC-016 | P288-5 | GT2P5 | |
| C85 | .05 | 400 | UCC-635 | P488-05 | GT4S5 | |
| C86 | .1 | 400 | UCC-640 | P488-1 | GT4H1 | |
| C87 | 4 | 400 | RCN-026 | | | |
| C88 | 5000 | | RCW-3014 | 1467-005 | 1D5D5 | GF2 |
| C89 | .05 | 200 | UCC-635 | P288-05 | GT2S5 | |
| C90 | .05 | 20000 | RCN-011 | | | |

* Some models may use 50MFD in this application.

## CONTR

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA G. E. PART No. | IRC PART No. | CLAROSTAT PART No. |
|---|---|---|---|---|---|
| R1 | 2 Meg. | 2 | RRC-091 | | |
| R2 | 10000 | 4 | RRC-088 | | 58-1000 |
| R3A | 50KΩ | 2 | RRC-090 | | |
| B | 250KΩ | 2 | | | |
| R4A | 7000Ω | 2 | RRC-059 | | |
| B | 500KΩ | 2 | | | |
| R5A | 100KΩ | 2 | RRC-087 | D11-128 | M-49-S |
| B | Shaft | | Not Req. | A | Not Req. |
| R6 | 1000Ω | 2 | RRC-086 | W-1000 | 10-1000 |

## RESIST

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA G. E. PART No. | IRC PART No. |
|---|---|---|---|---|
| R7 | 200Ω | ½ | URD-1032 | |
| R8 | 620Ω | 1 | URE-1068 | |
| R9 | 560Ω | 1 | URE-1067 | |
| R10 | 220KΩ | ½ | URD-1105 | |
| R11 | 22KΩ | ½ | URD-1082 | |
| R12 | 27KΩ | ½ | URE-083 | |
| R13 | 300Ω | 1 | URE-1060 | |
| R14 | 22KΩ | ½ | URD-1081 | |
| R15 | 1 Meg. | ½ | URD-121 | BTS-1 Meg. |
| R16 | 1 Meg. | ½ | URD-121 | BTS-1 Meg. |
| R17 | 100KΩ | ½ | URD-097 | BTS-100K |
| R18 | 82KΩ | ½ | URD-1095 | BTS-82K |
| R19 | 56KΩ | ½ | URD-091 | BTS-56K |
| R20 | 2700Ω | ½ | URD-1059 | BTS-2700-5% |
| R21 | 472 | ½ | URD-1017 | |
| R22 | 24KΩ | ½ | URD-1082 | |
| R23 | 1000Ω | ½ | URD-049 | BTS-1000 |
| R24 | 1500Ω | ½ | URD-1054 | BTS-1500 |
| R25 | 472 | ½ | URD-1017 | |
| R26 | 24KΩ | ½ | URD-1082 | |
| R27 | 1000Ω | ½ | URD-049 | BTS-1000 |
| R28 | 2700Ω | ½ | URD-1059 | BTS-2700-5% |
| R29 | 24KΩ | ½ | URD-1082 | |
| R30 | 1000Ω | ½ | URD-049 | BTS-1000 |
| R31 | 39KΩ | ½ | URD-088 | BTS-39K-5% |
| R32 | 5100Ω | ½ | URD-1066 | |
| R33 | 1 Meg. | 1 | URE-121 | BTS-1 Meg. |
| R34 | 4700Ω | 1 | URE-1066 | BTA-4700-5% |
| R35 | 5100Ω | 1 | URE-1069 | |
| R36 | 5100Ω | 1 | URE-1066 | |
| R37 | 22KΩ | 1 | URE-1081 | BTA-22K-5% |
| R38 | 22KΩ | 1 | URE-1081 | BTA-22K-5% |
| R39 | 5600Ω | 2 | URW-1067 | BTS-5600-5% |
| R40 | 1 Meg. | 2 | URW-1068 | BTS-1 Meg. |
| R41 | 12Ω | 1 | URE-1087 | |
| R42 | 330Ω | 1 | URE-1088 | BTA-330-5% |
| R43 | 1000Ω | 2 | URW-1049 | BTA-1000-5% |
| R44 | 1 Meg. | 2 | URW-121 | BTS-1 Meg. |
| R45 | 24KΩ | 2 | URW-1082 | |
| R46 | 270KΩ | 2 | URW-107 | BTS-270K |
| R47 | 2700Ω | 2 | URW-1059 | |
| R48 | 4700Ω | 2 | URW-1066 | BTS-4700-5% |
| R49 | 1000Ω | 2 | URW-1049 | |
| R50 | 100KΩ | 1 | URE-1097 | |
| R51 | 82KΩ | 1 | URE-1095 | |
| R52 | 10Ω | 1 | URE-1077 | |
| R53 | 1000Ω | 1 | URE-1049 | |
| R54 | 1 Meg. | 2 | URW-121 | |
| R55 | 24KΩ | 2 | URW-1082 | |
| R56 | 1000Ω | 2 | URW-1049 | |
| R57 | 4700Ω | 2 | URW-1066 | |
| R58 | 1000Ω | 2 | URW-1049 | |
| R59 | 1 Meg. | 2 | URW-121 | |
| R60 | 24KΩ | 2 | URW-1082 | |
| R61 | 1000Ω | 2 | URW-1049 | |
| R62 | 1 Meg. | 2 | URW-121 | |
| R63 | 24KΩ | 2 | URW-1082 | |
| R64 | 1000Ω | 2 | URW-1049 | |
| R65 | 1 Meg. | 2 | URW-121 | |
| R66 | 24KΩ | 2 | URW-1082 | |
| R67 | 1000Ω | 2 | URW-1049 | |
| R68 | 1 Meg. | 2 | URW-121 | |
| R69 | 24KΩ | 2 | URW-1082 | |
| R70 | 1000Ω | 2 | URW-1049 | |
| R71 | 1 Meg. | 2 | URW-121 | |
| R72 | 24KΩ | 2 | URW-1082 | |
| R73 | 1000Ω | 2 | URW-1049 | |
| R74 | 1 Meg. | 2 | URW-121 | |
| R75 | 24KΩ | 2 | URW-1082 | |
| R76 | 1000Ω | 2 | URW-1049 | |
| R77 | 1 Meg. | 2 | URW-121 | |
| R78 | 24KΩ | 2 | URW-1082 | |
| R79 | 1000Ω | 2 | URW-1049 | |
| R80 | 1 Meg. | 2 | URW-121 | |
| R81 | 24KΩ | 2 | URW-1082 | |
| R82 | 1000Ω | 2 | URW-1049 | |
| R83 | 1 Meg. | 2 | URW-121 | |
| R84 | 24KΩ | 2 | URW-1082 | |
| R85 | 1000Ω | 2 | URW-1049 | |
| R86 | 1 Meg. | 2 | URW-121 | |
| R87 | 24KΩ | 2 | URW-1082 | |
| R88 | 1000Ω | 2 | URW-1049 | |
| R89 | 1 Meg. | 2 | URW-121 | |
| R90 | 24KΩ | 2 | URW-1082 | |
| R91 | 1000Ω | 2 | URW-1049 | |
| R92 | 1 Meg. | 2 | URW-121 | |
| R93 | 24KΩ | 2 | URW-1082 | |
| R94 | 1000Ω | 2 | URW-1049 | |
| R95 | 1 Meg. | 2 | URW-121 | |
| R96 | 24KΩ | 2 | URW-1082 | |
| R97 | 1000Ω | 2 | URW-1049 | |
| R98 | 1 Meg. | 2 | URW-121 | |
| R99 | 24KΩ | 2 | URW-1082 | |
| R100 | 1000Ω | 2 | URW-1049 | |

# SCRIPTIONS

| o. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|
| -01 | ST-4-01 | TM-11 | Integrator Net. |
| -01 | ST-4-01 | TM-11 | " " |
| | ST-6-001 | TM-21 | Vert. Sync. Coupling |
| | ST-6-002 | TM-12 | Vert. M.V. Feedback |
| | ST-6-00 | TM-16 | " " " |
| | ST-6-001 | TM-21 | Vert. M.V. Grid Cap. |
| | ST-6-1 | TM-1 | Vert. Discharge |
| | | | Hor. Sync. Coupling |
| | | | Voltage Divider |
| | M..-22 | 1FM-22 | Sync. Coupling |
| | ST-4-2 | TC-2 | AFC Filter |
| | ST-4-002 | TM-22 | " " " |
| | ST-6-05 | TM-15 | AFC Plate Bypass |
| | | | Hor. Grid Cap. |
| | | | Hor. Discharge |
| | M0.5-34 | 1FM-34 | Hor. Sweep Coupling |
| | ST-2-5 | TC-5 | Hor. Output Cath. Byp. |
| | ST-6-1 | TM-1 | Hor. Output Screen Byp. |
| | | | Pulse Coupling |
| -01 | ST-6-01 | TM-11 | ACC Anode Bypass |
| | ST-2-5 | TC-5 | Hor. Coupling |
| | ST-4-05 | TM-15 | Damper Filter |
| | ST-4-1 | TM-1 | " " |
| | | | AFC Coupling |
| 5 | MW.5-25 | 1FM-25 | Vert. Output Fil. Byp. |
| | ST-4-05 | TM-15 | Contrast Cont. Byp. |
| | | | H.V. Filter |

† Some models may use 10MFD in this application.

| INSTALLATION NOTES | |
|---|---|
| olume control and switch tapped @ 500KΩ | |
| ocus control | |
| oriz. hold control | Dual concentric |
| ert. hold control | |
| rightness control | Dual concentric |
| ontrast control | |
| ert. Size control | |
| ttach to R5A Per Instructions | |
| ert. Linearity control | |

| IDENTIFICATION CODES | |
|---|---|
| esistors are ± 10% unless otherwise stated. | |
| athode | 5% |
| ate | 5% |
| " | 5% |
| Grid | |
| . Plate Coil Shunt | 5% |
| . Plate Decoupling | |
| Plate | 5% |
| Grid | |
| Network | 20% |
| " | 20% |
| " | |
| " | |
| " | |
| F Grid | 5% |
| F Cathode | 5% |
| F Screen | 5% |
| F Plate Decoupling | 20% |
| ideo IF Grid | |
| ideo IF Cathode | 5% |
| ideo IF Screen | 5% |
| ideo IF Plate Decoupling | 20% |
| ideo IF Grid | 5% |
| ideo IF Screen | 5% |
| ideo IF Decoupling | 20% |
| ideo IF Trans. Shunt | 5% |
| Det. Load | 5% |
| mp. Grid | 20% |
| mp. Plate | 5% |
| " " | 5% |
| " " | 5% |
| " " | 5% |
| " " | 5% |
| e Divider | 5% |
| Amp. Grid | 20% |
| Amp. Cathode | 5% |
| Amp. Plate | 5% |
| " | 5% |
| ent Isolation | 20% |
| re Tube Cathode | 5% |
| Network | |
| e Divider | 5% |
| | 5% |
| ound IF Cathode | 5% |
| ound IF Screen | |
| ound IF Plate Decoupling | 5% |
| ound IF Cathode | 5% |
| ound IF Screen | |
| ound IF Plate | 5% |
| ter Grid | |
| ter Screen | |
| ter Plate Decoupling | 20% |
| mpensate | 10% |
| Compensation | 10% |
| " | 10% |
| " | 20% |
| rid | 20% |
| late | |
| r Grid | 20% |
| r Screen | 5% |

## RESISTORS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA G.E. PART No. | REPLACEMENT DATA IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| R66 | 2.5 Meg. | ½ | URE-129 | BTS-2.2 Meg. | Sync. Phase Inv. Grid 2 |
| R67 | 100KΩ | ½ | URE-049 | BTS-1000 | Sync. Phase Inv. Cathode 2 |
| R68 | 15KΩ | 1 | URE-077 | BTA-15K | Sync. Phase Inv. Plate |
| R69 | 3.9 Meg. | ½ | URE-135 | BTS-3.9 Meg. | Sync. Clipper Grid |
| R70 | 680Ω | ½ | URE-089 | BTS-6800 | Sync. Clipper Cathode |
| R71 | 150Ω | ½ | URE-1054 | BTS-1500 | Sync. Clipper Plate |
| R72 | 820Ω | ½ | URE-071 | BTS-8200 | Integrator |
| R73 | 820Ω | ½ | URE-071 | BTS-8200 | Integrator |
| R74 | 75KΩ | ½ | URE-1094 | | Vert. Multi. Grid 5 |
| R75 | 220KΩ | ½ | URE-1105 | BTS-220K-5% | Vert. Multi. Plate 3 |
| R76 | 82KΩ | ½ | URE-1095 | BTS-82K-5% | Vert. Multi. Grid 5 |
| R77 | 24KΩ | ½ | URE-1082 | | " " " See Note 1 |
| R78 | 2.2 Meg. | ½ | URE-1129 | BTS-2.2Meg-5% | Vert. Multi. Plate 5 |
| R79 | 27KΩ | 1 | URE-083 | BTA-27K | Voltage Dropping |
| R80 | 470Ω | ½ | URE-1041 | BTS-470 | Vert. Output Cathode |
| R81 | 100KΩ | ½ | URE-097 | BTS-100K | Vert. Output Trans. Shunt |
| R82 | 820Ω | 2 | URE-047 | BT-2-820 | Filter |
| R83 | 1600Ω | ½ | URE-1054 | | Vert. Output Trans. Shunt 5 |
| R84 | 2700Ω | ½ | URE-1069 | BTS-2700 | Integrator Network |
| R85 | 1 Meg. | ½ | URE-1121 | BTS-1 Meg-5% | Horiz. AFC Grid 5 |
| R86 | 18KΩ | ½ | | BTS-18K | Horiz. AFC Filter |
| R87 | 150KΩ | 1 | URE-1103 | BTA-150K | Horiz. AFC Cathode |
| R88 | 82KΩ | ½ | URE-1095 | BTS-82K-5% | Voltage Divider 5 |
| R89 | 33KΩ | ½ | URE-085 | BTS-33K-5% | " " 5 |
| R90 | 3.3 Meg. | 1 | URE-133 | BTA-3.3 Meg. | " " |
| R91 | 47KΩ | ½ | URE-089 | BTS-47K | Horiz. Osc. Grid |
| R92 | 24KΩ | ½ | URE-1082 | | Voltage Divider |
| R93 | 100KΩ | 1 | URE-097 | BTA-100K | " " |
| R94 | 82KΩ | 2 | URF-1095 | BT-2-82K | Horiz. Osc. Plate |
| R95 | 100KΩ | ½ | URE-097 | BTS-100K | Filter |
| R96 | 150KΩ | ½ | URE-101 | BTS-150K | AFC Feedback |
| R97 | 1 Meg. | ½ | URE-121 | BTS-1 Meg. | Horiz. Output Grid |
| R98 | 330Ω | ½ | URE-057 | BTA-330 | Parasitic Suppressor |
| R99 | 82Ω | 2 | URF-1023 | | Horiz. Output Cathode |
| R100 | 33Ω | 1 | URE-013 | | Parasitic Suppressor |
| R101 | 470KΩ | 1 | URE-113 | | Current Limiting |
| R102 | 50KΩ | 2 | URF-083 | BT-2-27K-5% | Horiz. Output Screen 5 |
| R103 | 30KΩ | 2 | URF-083 | BT-2-27K-5% | " " " 5 |
| R104 | 120KΩ | ½ | URE-099 | BTS-120K-5% | " " " 5 |
| R105 | 470KΩ | ½ | URE-113 | | HV Filter |
| R106 | 560KΩ | ½ | URE-115 | BTS-560K-5% | Feedback Network 5 |
| R107 | 470ΩΩ | ½ | URE-065 | BTS-4700-5% | Linearity Coil Shunt 20 |
| R108 | 330ΩΩ | 2 | URF-061 | BT-2-3300 | Horiz. Size Coil Shunt 20 |
| R109 | 1 Meg. | ½ | URE-121 | BTS-1 Meg. | Isolation 20 |
| R110 | 2200Ω | 2 | URF-1057 | BT-2-2200 | Filter |
| R111 | 560Ω | 7 | RRW-028 | | Focus Coil Shunt |
| R112 | 1Ω | ½ | RRW-034 | BW-½-1 | Filament Dropping |

Note 1. Some models have this resistor shorted out.

## TRANSFORMER (POWER)

| ITEM No. | RATING PRI. | RATING SEC. 1 | RATING SEC. 2 | RATING SEC. 3 | REPLACEMENT DATA G. E. PART No. | REPLACEMENT DATA STANCOR PART No. | REPLACEMENT DATA CHICAGO PART No. | REPLACEMENT DATA MERIT PART No. |
|---|---|---|---|---|---|---|---|---|
| T1 | 117VAC @ 2.1A | 780VCT @ .130 ADC & 670VCT @ .115 ADC | 5VAC @ 3A SEC. 4 6.3VAC @ 2.6A | 5VAC @ 2A SEC. 5 12.6VAC @ 3.6A | RTP-300 | | | |

## TRANSFORMER (SWEEP CIRCUITS)

| ITEM No. | RATING DC RESISTANCE PRI. | RATING DC RESISTANCE SEC. | REPLACEMENT DATA G. E. PART No. | REPLACEMENT DATA STANCOR PART No. | REPLACEMENT DATA CHICAGO PART No. | REPLACEMENT DATA MERIT PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| T2 | 12Ω | | RTM-003 | | | | Hor. Block. Osc. Trans. |
| | Tap. @ 35Ω | | | | | | |
| T3 | 38Ω | SEC. 1 230Ω | RTO-067 | | | | Hor. Output Trans. |
| | | SEC. 2 1Ω | | | | | |
| | | SEC. 3 .02 | | | | | |
| T4 | 750Ω | 11Ω | RTO-053 | A-8115 | T89-1 | A-80.. | Vert. Output Trans. |
| T5A | 18Ω | | RLD-006 | | | | Hor. Deflection Yoke |
| | 28Ω | | | | | | Vert. Deflection Yoke |
| T6 | 100Ω | | RLF-013 | | | | Focus Coil |

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | RATING IMPEDANCE PRI. | RATING IMPEDANCE SEC. | RATING DC RES. PRI. | RATING DC RES. SEC. | REPLACEMENT DATA G. E. PART No. | REPLACEMENT DATA STANCOR PART No. | REPLACEMENT DATA CHICAGO PART No. | REPLACEMENT DATA MERIT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| T7 | 74.. | 3.2.. | 5.. | .0.. | RT..-0.. | A-8479 | P0-13 | A-2902 | |

## SPEAKER

| ITEM No. | RATING | | REPLACEMENT DATA G. E. PART No. | REPLACEMENT DATA JENSEN PART No. | REPLACEMENT DATA QUAM PART No. | NOTES |
|---|---|---|---|---|---|---|
| | FIELD RES. | V. C. IMP. | | | | |
| S1a | FM | 3.2Ω | RO..-1.. | ST-12.. | 12A.1 | * Replace output trans. to match 6-8Ω voice coil. |
| | | | | MOD.P10-8 | | # Used in early production. |
| S1 | PM | 3.2Ω | UOP-8670 | | | Ø Used in late production. |
| | CONE DIA. | V. C. DIA. | | | | |
| S1a | 3 3/4" | 3/4" | | | | |
| S1 | 7 .../2" | | | | | |

GENERAL ELECTRIC MODEL 811

# PARTS LIST AND DESCRIPTIONS (Continued)

## FILTER CHOKE

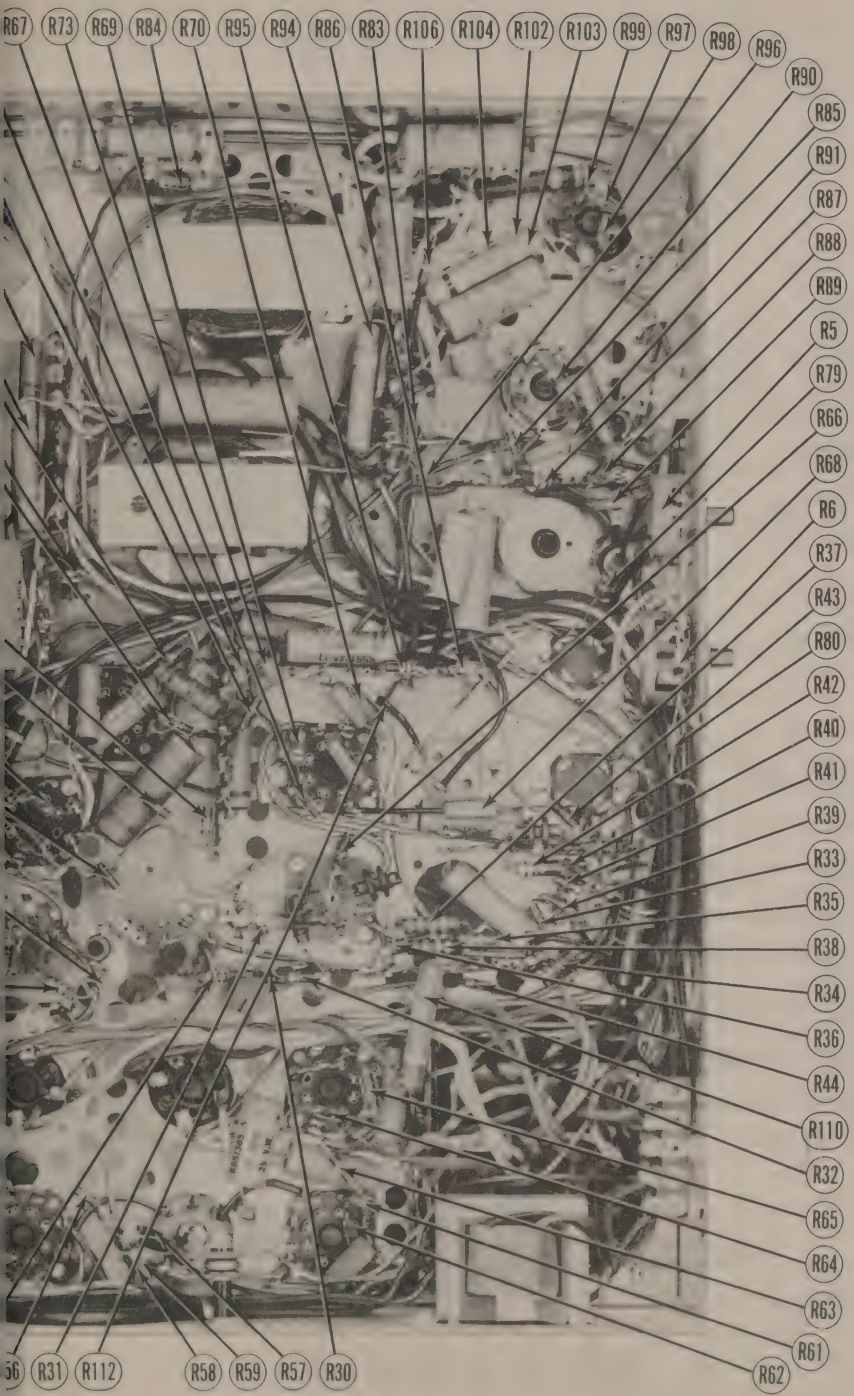
| ITEM No. | RATINGS | | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | TOTAL DIRECT CURRENT | D. C. RESISTANCE | INDUCTANCE (0 CURRENT 1000 ~) | G. E. PART No. | STANCOR PART No. | CHICAGO PART No. | MERIT PART No. | |
| L1 | .135A | 160Ω | 7 Henry | RLI-059 | C-2309 | R-8120 | C-2993 | |
| L2 | .115A | 160Ω | 7 Henry | RLI-060 | C-2309 | R-8120 | C-2993 | |

## COILS (RF-IF)

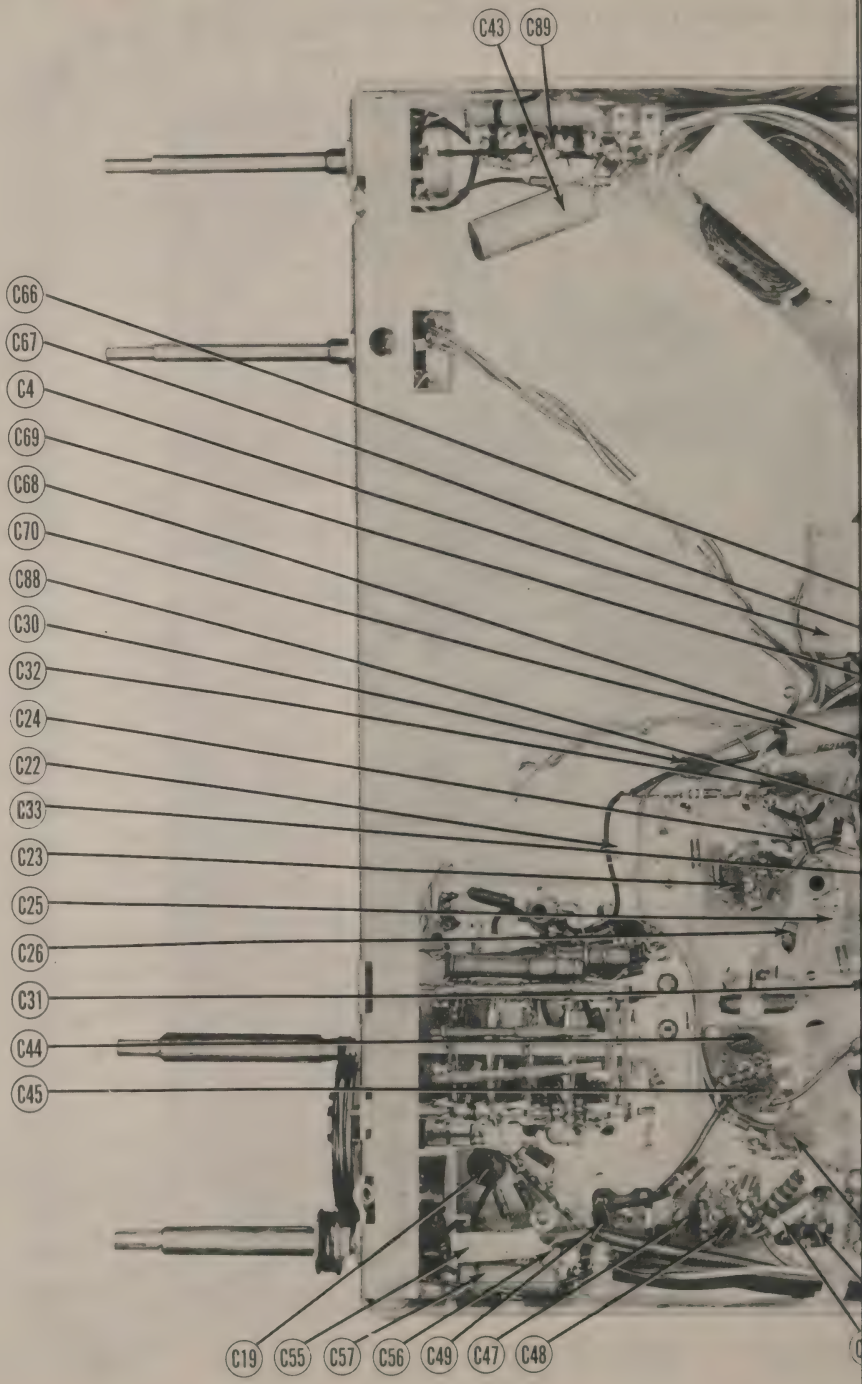
| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | | PRI. | SEC. | G. E. PART No. | MEISSNER PART No. | |
| L3 | Ant. Input | 0Ω | 0Ω | RLA-031 | | |
| L4 | RF Choke | 0Ω | | RLI-006 | | |
| L5 | RF Choke | .2Ω | | RLI-003 | | |
| L6 | RF Choke | 0Ω | | RLI-006 | | |
| L7 | RF Plate, Conv. Grid & Osc. Coil | 0Ω | | RLC-069 | | Channel 2 |
| L8 | RF Plate, Conv. Grid & Osc.Coils | 0Ω | | RLC-070 | | Channel 3 |
| L9 | RF Plate, Conv. Grid & Osc.Coils | 0Ω | | RLC-071 | | Channel 4 |
| L10 | RF Plate, Conv. Grid & Osc.Coils | 0Ω | | RLC-072 | | Channel 5 |
| L11 | RF Plate, Conv. Grid & Osc.Coils | 0Ω | | RLC-073 | | Channel 6 |
| L12 | RF Plate & Conv. Grid Coils | 0Ω | | RLA-032 | | Channel 7 |
| L13 | RF Plate & Conv. Grid Coils | 0Ω | | RLA-032 | | Channel 8 -9 |
| L14 | RF Plate & Conv.Grid Coils | 0Ω | | RLA-032 | | Channel 10-11 |
| L15 | RF Plate & Conv. Grid Coils | 0Ω | | RLA-032 | | Channel 12-13 |
| L16 | Osc. Coil | 0Ω | | RLC-074 | | Channel 7 |
| L17 | Osc. Coil | 0Ω | | RLC-075 | | Channel 8-9 |
| L18 | Osc. Coil | 0Ω | | RLC-076 | | Channel 10-11 |
| L19 | Osc. Coil | 0Ω | | RLC-077 | | Channel 12-13 |
| L20 | RF Choke | 1.2Ω | | RLI-032 | | |
| L21 | 1st Video IF | .5Ω CT | | RTL-081 | | |
| L22 | RF Choke | .2Ω | | RLI-005 | | Video Carrier-Set Trap |
| L23 | 2nd Video IF | .5Ω CT | | RTL-082 | | |
| L24 | Sound Take-Off Coil | .5Ω | | RLI-061 | | |
| L25 | 3rd Video IF | .5Ω CT | | RTL-083 | | |
| L26 | 4th Video IF | .6Ω CT | | RTL-084 | | |
| L27 | Peaking | 6.3Ω | | RLI-036 | | Inductance-165 Microhenries |
| L28 | Peaking | 7Ω | | RLI-038 | | " " " |
| L29 | Peaking | 7Ω | | RLI-038 | | " " " |
| L30 | Peaking | 7Ω | | RLI-038 | | " " " |
| L31 | 1st Sound IF | .2Ω | .2Ω | RTL-090 | | Not used in early productions |
| L32 | 2nd Sound IF | .2Ω | | RTL-085 | | |
| L33 | Sound Disc. XFMR | .2Ω | .2Ω | RTD-007 | | |
| L34 | Horiz. Size Control | 2.5Ω | 11Ω | RLD-004 | | |
| L35 | Horiz. Linearity Control | 30Ω | | RLD-005 | | |
| L36 | Fil. Choke | .2Ω | | | | |

## MISCELLANEOUS

| ITEM No. | PART NAME | G. E. PART No. | NOTES |
|---|---|---|---|
| M2 | RF Coil & Switch Assy | RJX-023 | |
| | Trimmer | RCY-045 | Horiz. Freq. 25-150MMF |
| | Trimmer | RCY-045 | Horiz. Drive 25-150MMF |
| | Trimmer | RCY-047 | Sound IF Take-Off Trap, 1.5-15MMF |
| | Trimmer | RCY-047 | Video Carrier-Set Trap, 1.5-15MMF |
| | Cabinet | RAV-059 | |
| | Safety Glass | RDW-010 | |
| | Tuning Slug | REI-014 | RF and Conv. Slugs for L12, 13, 14, and 15 |
| | Core | REI-015 | Adjustments Core for T2 |
| | Core | REI-016 | Tuning Core for L21, 23, 25, 26 and L32 |
| | Core | REI-017 | Adjustment Core for L33 |
| | Core | REI-018 | Adjustment Core for L34 |
| | Core | REI-019 | Tuning Core for L33 |
| | Antenna Terminal Strip | RJB-020 | |
| | Receptacle | RJJ-007 | AC Power |
| | Socket | RJS-119 | Picture Tube |
| | Knob | RDK-012 | Vert. Speed, and Contrast Controls |
| | Knob | RDK-104 | Horiz. Speed, and Brightness Controls |
| | Knob | RDK-139 | Focus, and Tuning Control |
| | Knob | RDK-140 | On-Off Switch, and Volume, Channel Selector Controls |




ESISTOR IDENTIFICATION




CHASSIS BOTTOM VIEW-C

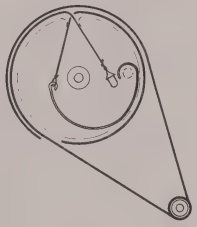
# CENTERING ADJUSTMENTS

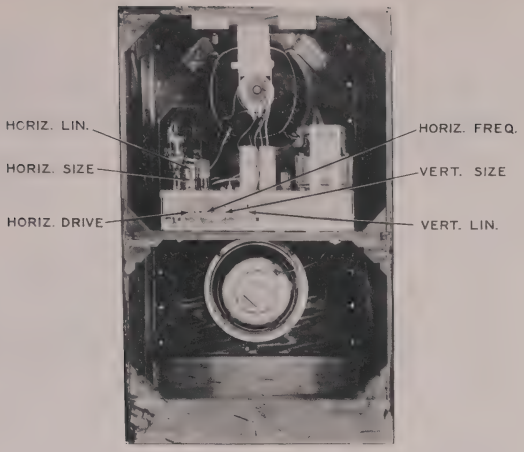
Centering adjustments are made by means of two circular magnets mounted on the focus and deflection assembly. The assembly may be turned the necessary direction, and the amount of correction may be changed by rotating the large magnet with respect to the smaller one and by sliding the two magnets together or apart. Maximum effect is with the two magnets close together and aligned. Minimum effect is achieved by turning the large magnet to oppose the small one.

# HORIZONTAL LINEARITY ADJUSTMENT

The horizontal drive control should first be set to minimum capacity. With the horizontal size control at approximately its correct position adjust the horizontal linearity control for best linearity. If this does not give good linearity turn the horizontal drive control slightly clockwise and repeat the adjustments. If there is a foldover of the pattern, turn the horizontal drive control clockwise until the fold disappears.

# DIAL CORD STRINGING






CABINET-REAR VIEW

PHOTOFACT* Folder

# HALLICRAFTERS
# MODELS T-60, T-68

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MODELS T-60, T-68

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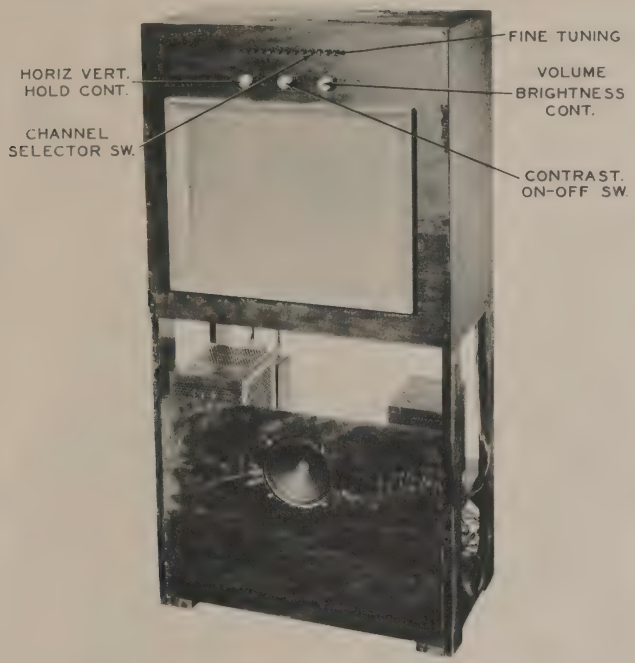
**Date 6/49—No. 4911-10 Set No. 63—Folder No. 10**




MODEL T-60

| | |
|---|---|
| **TRADE NAME** | Hallicrafters, Models T-60, T-68 |
| **MANUFACTURER** | The Hallicrafters Co., 4401 W. Fifth Ave., Chicago, Illinois |
| **TYPE SET** | Projection Television Receiver |
| **TUBES** | Twenty-Four |
| **POWER SUPPLY** | 105-125 Volts, 60 Cycles AC |
| **TUNING RANGE**—Channels 2 through 13 | RATING 2.01 Amp. @ 117 Volts |

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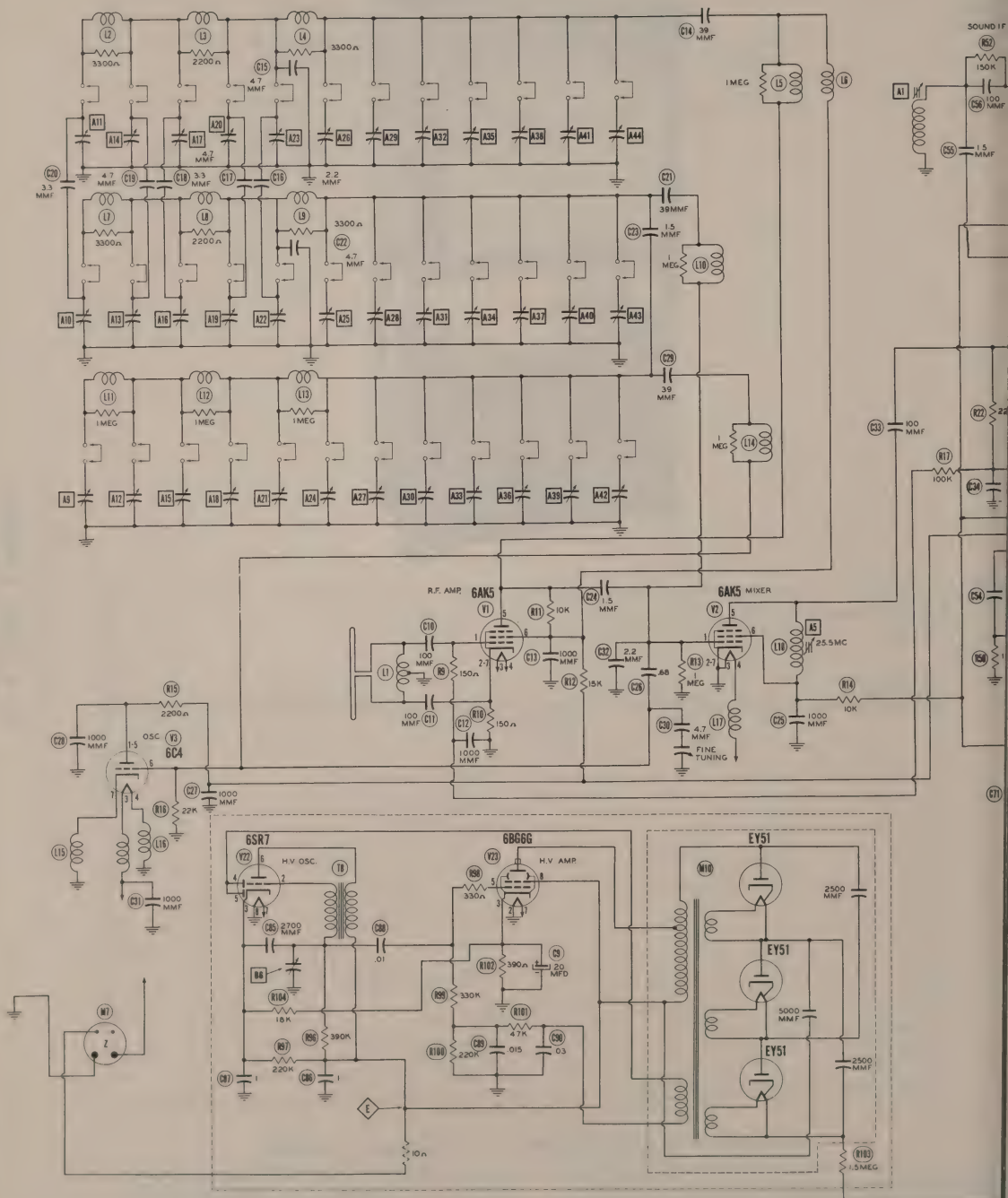
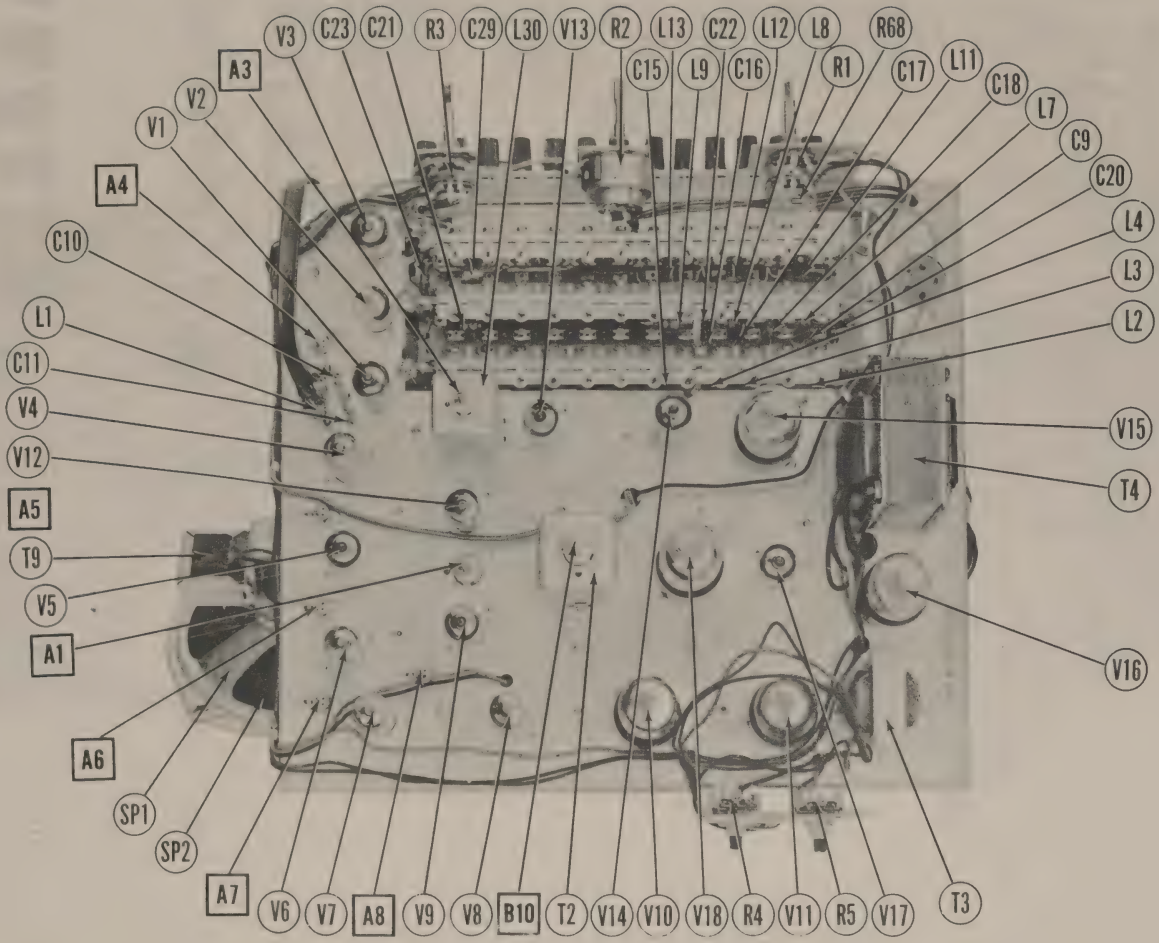
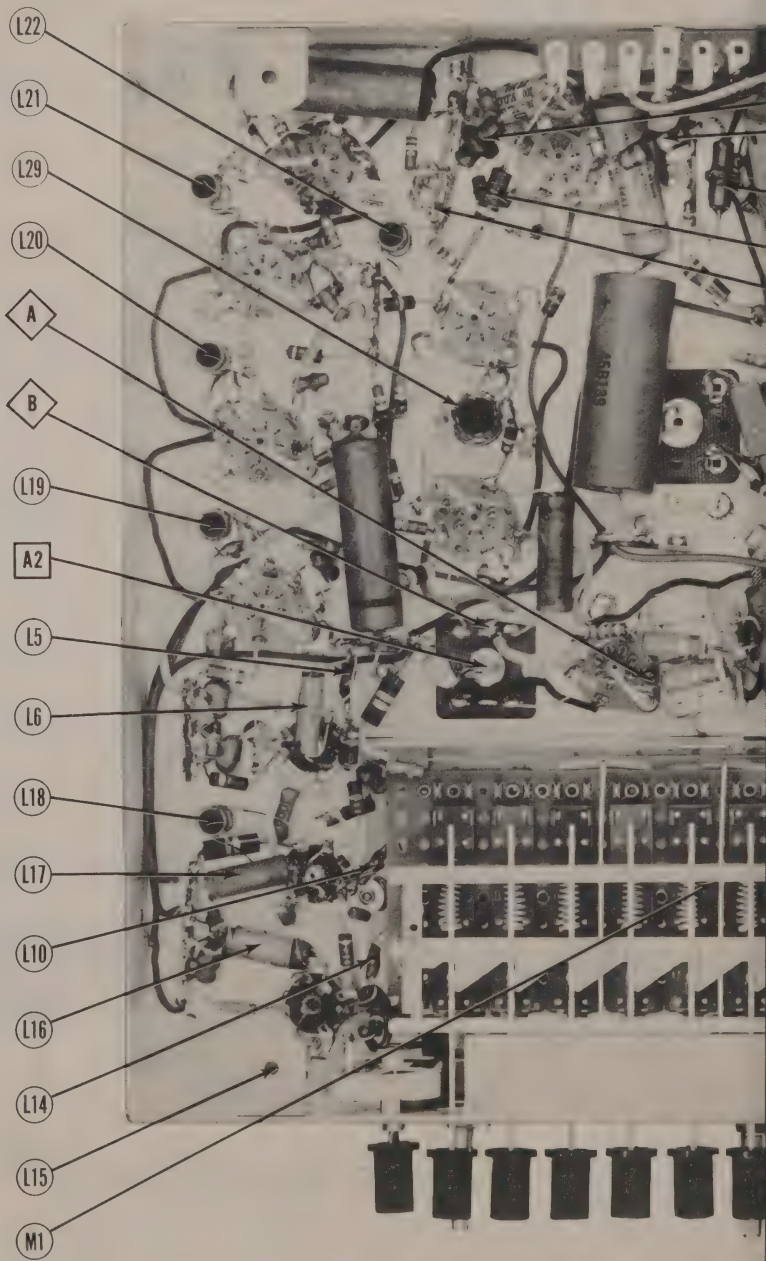
DATE 6/49 4911-10 SET #63 FOLDER 10

HALLICRAFTERS
MODELS T-60, T-68

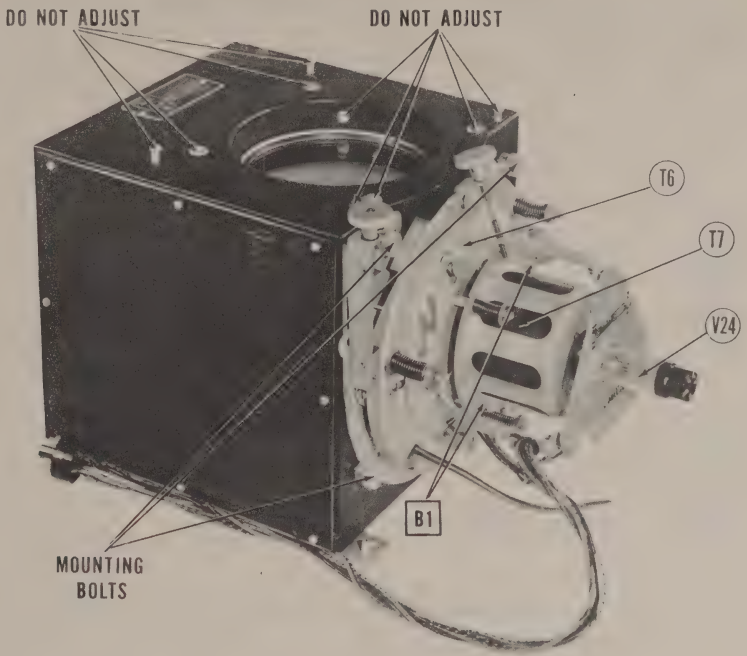

SOUND IF
R.F. AMP. 6AK5
6AK5 MIXER
OSC 6C4
6SR7 H.V. OSC.
6BG6G H.V. AMP.
EY51
EY51
EY51
25.5MC
FINE TUNING
1 MEG
150K
100K
10K
22K
2200Ω
3300Ω
2200Ω
330Ω
390Ω
220K
390K
330K
150Ω
15K
4.7K
2700 MMF
5000 MMF
2500 MMF
1000 MMF
100 MMF
1.5 MMF
2.2 MMF
.68
.01
.015
.03
20 MFD
10Ω
1.5MEG



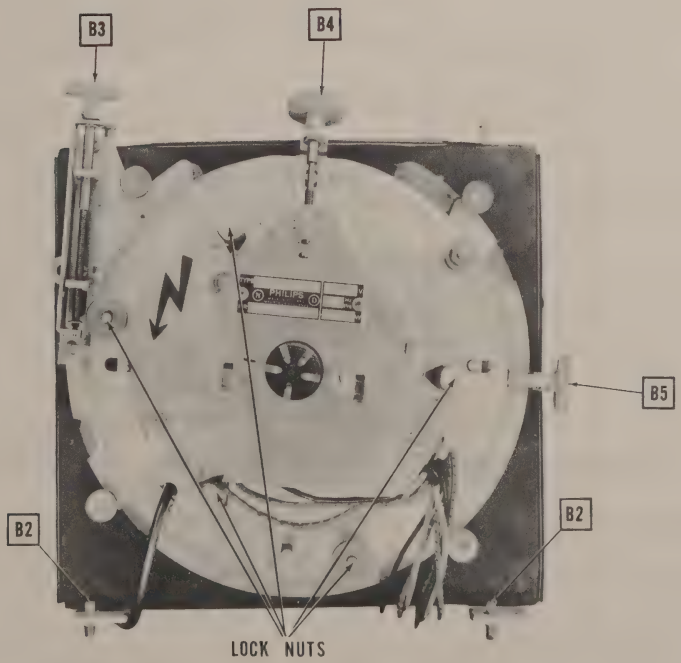

CHASSIS TOP VIEW




CHASSIS BOTTOM VIEW-TRANS., INDU




PROJECTION UNIT




DEFLECTION AND FOCUS COIL ASSEMBLY

# ALIGNMENT INSTRUCTIONS

## SOUND IF ALIGNMENT

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1. | 5000MMF | High side to pin 1 (Grid) 6AU6 (V9). Low side to chassis. | 4.5MC (Unmod.) | Any | DC Probe to pin 7 6AL5 (V13) point (A) Common lead to chassis. | A1, A2 | Adjust for maximum deflection. Attenuate signal generator to give approximately 1 volt reading on VTVM. |
| 2. | 5000MMF | " | " | " | DC Probe to Point (B) Common to chassis. | A3 | Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. |

Shift the frequency of the signal generator either side of 4.5MC and slightly readjust A2 for approximately equal peaks. For best results, use only enough signal generator output to give one volt peaks. Retouch A3 for null point.

## VIDEO IF ALIGNMENT

Remove oscillator tube V3 (6C4) before aligning the IF coils to prevent any possible spurious beats which might give improper alignment.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 3. | Two 150Ω carbon res. | Insert resistor in each generator lead and connect across antenna terminal. | 26.2MC<br>25.5MC<br>23.5MC<br>23.0MC<br>22.2MC<br>26.2MC | 2<br>"<br>"<br>"<br>"<br>" | DC Probe to point (C) Common to chassis. | A4<br>A5<br>A6<br>A7<br>A8<br>A4 | Adjust the five IF coils at their listed frequencies for maximum deflection keeping signal generator level at such a point to maintain approximately a two volt reading on VTVM. Repeak A4 at 26.2MC with a signal generator attenuated to give 1 volt reading on VTVM. |

Tune the signal generator from 21MC thru 26.25MC, attenuated to give a 1 1/2 volt reading on VTVM at the peaks. Plot IF Response curve. Check readings at 21.75MC, 26.25MC and the dip between peaks. See Figure 1 for correct response curve.

## OVERALL IF RESPONSE CHECK

Connect synchronized sweep voltage from signal generator to horizontal amplifier in scope to obtain horizontal deflection.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 4. | 5000MMF | High side to pin 1 (Grid) 6AK5 (V2). Low side to chassis. | 24MC (10MC Sweep) | 21.75MC<br>26.25MC | 2 | Vert. Amp. to Point (C) Low side to chassis. | | If necessary, slightly retouch A4, A5, A6, A7 and A8 to obtain pattern similar to Figure 1. Check to see that markers fall at proper points. |

## RF ALIGNMENT

The local oscillator operates 24.5MC above the center frequency of each TV channel. To set the local oscillator a separate "BFO" generator set at 24.5MC is used to obtain a zero, beat with this difference frequency.

Couple the "BFO" generator to the receiver by connecting the output lead to a coil of hookup wire wrapped around the video detector tube (V8). Set the fine tuning control to the center of its capacity range.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | BFO GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 5. | Two 150Ω carbon res. | Across antenna terminals with 150Ω resistor in each generator lead. | 57MC | 24.5MC | 2 | DC Probe to point (C) Common to chassis. | A9 | Connect .01MFD capacitor between pin 1 (Grid) of the 3NP4 picture tube (V24) and pin 1 (Grid) of 6AU6 audio amp. (V14). Adjust A9 for rough audio beat in speaker. Disconnect the .01MFD. capacitor. |
| 6. | Two 150Ω carbon res. | " | " | Off | " | " | A10, A11 | Adjust for maximum deflection. |
| 7. | Two 150Ω carbon res. | " | 63MC | 24.5MC | 3 | " | A12 | Reconnect .01MFD capacitor as in step 5 and adjust for rough audio beat. Remove .01MFD capacitor. |
| 8. | Two 150Ω carbon res. | " | " | Off | " | " | A13, A14 | Adjust for maximum deflection. |
| 9. | Two 150Ω carbon res. | " | 69MC | 24.5MC | 4 | " | A15 | Reconnect .01MFD capacitors as in step 5 and adjust for rough audio beat. Remove .01MFD capacitor. |
| 10. | Two 150Ω carbon res. | " | " | Off | " | " | A16, A17 | Adjust for maximum deflection. |
| 11. | Two 150Ω carbon res. | " | 79MC | 24.5MC | 5 | " | A18 | Reconnect .01MFD capacitors as in step 5 and adjust for rough audio beat. Remove .01MFD capacitor. |
| 12. | Two 150Ω carbon res. | " | " | Off | " | " | A19, A20 | Adjust for maximum deflection. |
| 13. | Two 150Ω carbon res. | " | 85MC | 24.5MC | 6 | " | A21 | Reconnect .01MFD capacitor as in step 5 and adjust for rough audio beat. Remove .01MFD capacitor. |
| 14. | Two 150Ω carbon res. | " | " | Off | " | " | A22, A23 | Adjust for maximum deflection. |
| 15. | Two 150Ω carbon res. | " | 177MC | 24.5MC | 7 | " | A24 | Reconnect .01MFD capacitor as in step 5 and adjust for rough audio beat. Remove .01MFD capacitor. |
| 16. | Two 150Ω carbon res. | " | " | Off | " | " | A25, A26 | Adjust for maximum deflection. |
| 17. | Two 150Ω carbon res. | " | 183MC | 24.5MC | 8 | " | A27 | Reconnect .01MFD capacitor as in step 5 and adjust for rough audio beat. Remove .01MFD capacitor. |
| 18. | Two 150Ω carbon res. | " | " | Off | " | " | A28, A29 | Adjust for maximum deflection. |

RF ALIGNMENT (CONT.)

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 19. | Two 150Ω carbon res. | " | 189MC | 24.5MC | 9 | " | A30 | Reconnect .01MFD capacitor as in step 5 and adjust for rough audio beat. Remove .01MFD capacitor. |
| 20. | Two 150Ω carbon res. | " | " | Off | " | " | A31, A32 | Adjust for maximum deflection. |
| 21. | Two 150Ω carbon res. | " | 195MC | 24.5MC | 10 | " | A33 | Reconnect .01MFD capacitor as in step 5 and adjust for rough audio beat. Remove .01MFD capacitor. |
| 22. | Two 150Ω carbon res. | " | " | Off | " | " | A34, A35 | Adjust for maximum deflection. |
| 23. | Two 150Ω carbon res. | " | 201MC | 24.5MC | 11 | " | A36 | Reconnect .01MFD capacitor as in step 5 and adjust for rough audio beat. Remove .01MFD capacitor. |
| 24. | Two 150Ω carbon res. | " | " | Off | " | " | A37, A38 | Adjust for maximum deflection. |
| 25. | Two 150Ω carbon res. | " | 207MC | 24.5MC | 12 | " | A39 | Reconnect .01MFD capacitor as in step 5 and adjust for rough audio beat. Remove .01MFD capacitor. |
| 26. | Two 150Ω carbon res. | " | " | Off | " | " | A40, A41 | Adjust for maximum deflection. |
| 27. | Two 150Ω carbon res. | " | 213MC | 24.5MC | 13 | " | A42 | Reconnect .01MFD capacitor as in step 5 and adjust for rough audio beat. Remove .01MFD capacitor. |
| 28. | Two 150Ω carbon res. | " | " | Off | " | " | A43, A44 | Adjust for maximum deflection. |

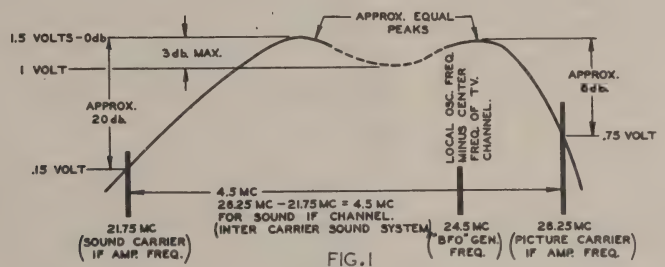


FIG. 1

## HIGH VOLTAGE OSCILLATOR ADJUSTMENT

The blocking oscillator frequency in the high voltage supply should be maintained at 1000 ± 70 cycles. Unless a component that determines frequency has been altered or replaced, adjustment is not usually necessary. The frequency should be checked if the 6SR7 tube (V22) or any of the associated parts have been replaced.

The 1000 cycle adjustment controls the oscillator frequency which determines the filament supply of the three sealed rectifiers but has little effect on current regulation and voltage output.

Insert a 10Ω resistor in the B+ lead as shown on the schematic and connect the vertical amplifier of the scope between point E and the chassis. Feed a 1000 cycle signal from an audio generator to the horizontal sweep amplifier of the oscilloscope. Adjust B6 for a single stable Lissajous pattern as shown in figure 2.

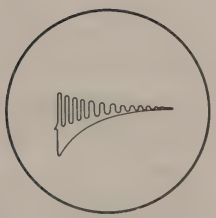


FIG. 2

Be sure to remove the 10Ω resistor after the adjustments is made.

## HORIZONTAL SWEEP CIRCUIT ADJUSTMENT

1. Turn the horizontal drive adjustment (B7) clockwise as far as possible without crowding the right hand side of the test pattern. Insufficient horizontal drive will result in the raster falling short of filling the mask horizontally.
2. Should the horizontal hold control fail to hold the test pattern, set this control to the middle of its rotation and adjust the horizontal oscillator adjustment (B10) for horizontal "sync".
3. Set the width (B9) and horizontal centering controls so test pattern fits and is centered in the mask horizontally.
4. Adjust the horizontal linearity slug (B8) so picture is symmetrical from left to right. Slight adjustment of B7 (Horizontal drive) may be necessary when making this adjustment.

# ADJUSTMENT OF OPTICAL SYSTEM

This operation should be necessary only when replacing the 3NP4 or the focus and deflection coils.

Before turning on the set, turn both the contrast and brightness control full off. After about one minute slowly advance the controls for a medium bright raster. (If a spot or line appears on the screen, immediately turn brightness control full off and determine cause of sweep failure).

Adjust the focus control for the best possible focus on the face of the tube. This is necessary since no amount of mechanical focusing can correct a defocused image on the face of the tube.

Adjust the centering controls to center picture on the face of the tube. If mechanical centering is required in addition to the electrical centering, adjust the two centering screws B1. While adjusting these screws, be careful not to force the focus coil against the neck of the tube by tilting it excessively in either direction. With the raster centered on the face of the tube the image should be centered on the viewing screen. Many test patterns have wedges or arrows which indicate the edges of the picture. If a pattern having these marks is being received, they can be used for checking the centering. If picture is not properly centered on the viewing screen loosen the three mounting bolts of the projection unit and adjust the three leveling screws B2 to center the pattern on the viewing screen.

If the pattern tilts on the screen, loosen the four mounting bolts and rotate the mounting assembly slightly as required. Tighten the mounting bolts .

Check to see that the pattern is still in sharp focus on the face of the tube. The picture should also be in focus on the viewing screen. If it is not, loosen the five locking nuts about one turn each. Adjust the overall focusing adjustment B3 to focus the center of the picture. Adjust the horizontal focusing adjustment B4 for equal focus in the areas on each side of the center. Adjust the vertical focusing adjustment B5 for equal focus above and below the center. After each adjustment of B4 and B5 check the overall focus adjustment B3. By careful adjustment of B3, B4 and B5, the entire pattern can be brought into focus. After completing the adjustments tighten the five locking nuts.

CAUTION- The screws on top of the projection unit are adjustments for the optical system inside the unit and under no circumstances should they be disturbed. These adjustments or replacement of the optical parts must be done at the factory.

# CARE OF THE OPTICAL SYSTEM

CARE OF THE OPTICAL SYSTEM

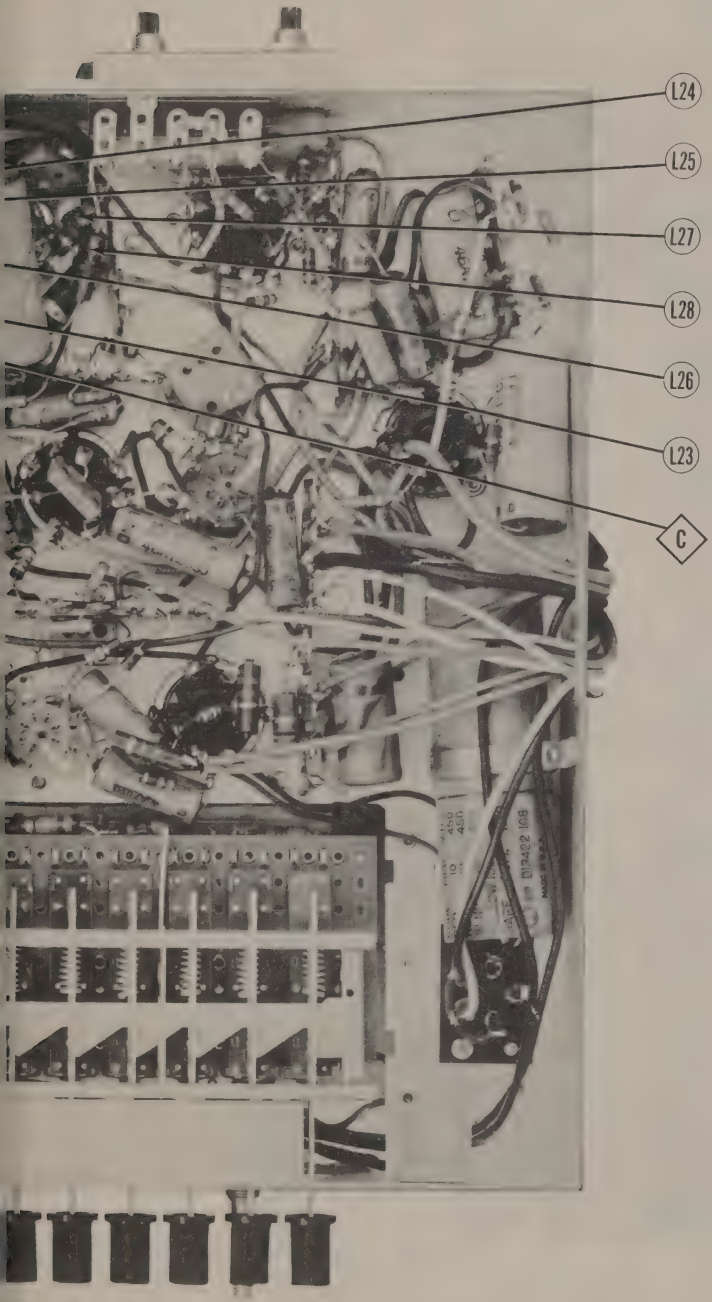
The optical components of a projection type of television receiver must remain free of dust and film to retain the orignal picture brilliance. The components of this optical system that will require occasional cleaning are the viewing screen, diagonal mirror, and top face of the projection unit window.

Loose dust may be safely removed with a camel hair brush.. The diagonal mirror and viewing screen may be cleaned of film by any normal glass cleaning procedure provided abrasives are avoided. Cleaning with absorbent cotton and a clean, soft cloth is satisfactory. Avoid the use of cleaning powders abrasive soaps and similar abrasives. Freshly laundered soft cloths should be used to avoid abrading the surface of the optical system. Use water or other cleaning liquids sparingly on the window of the projection unit to avoid getting the moisture inside the unit.

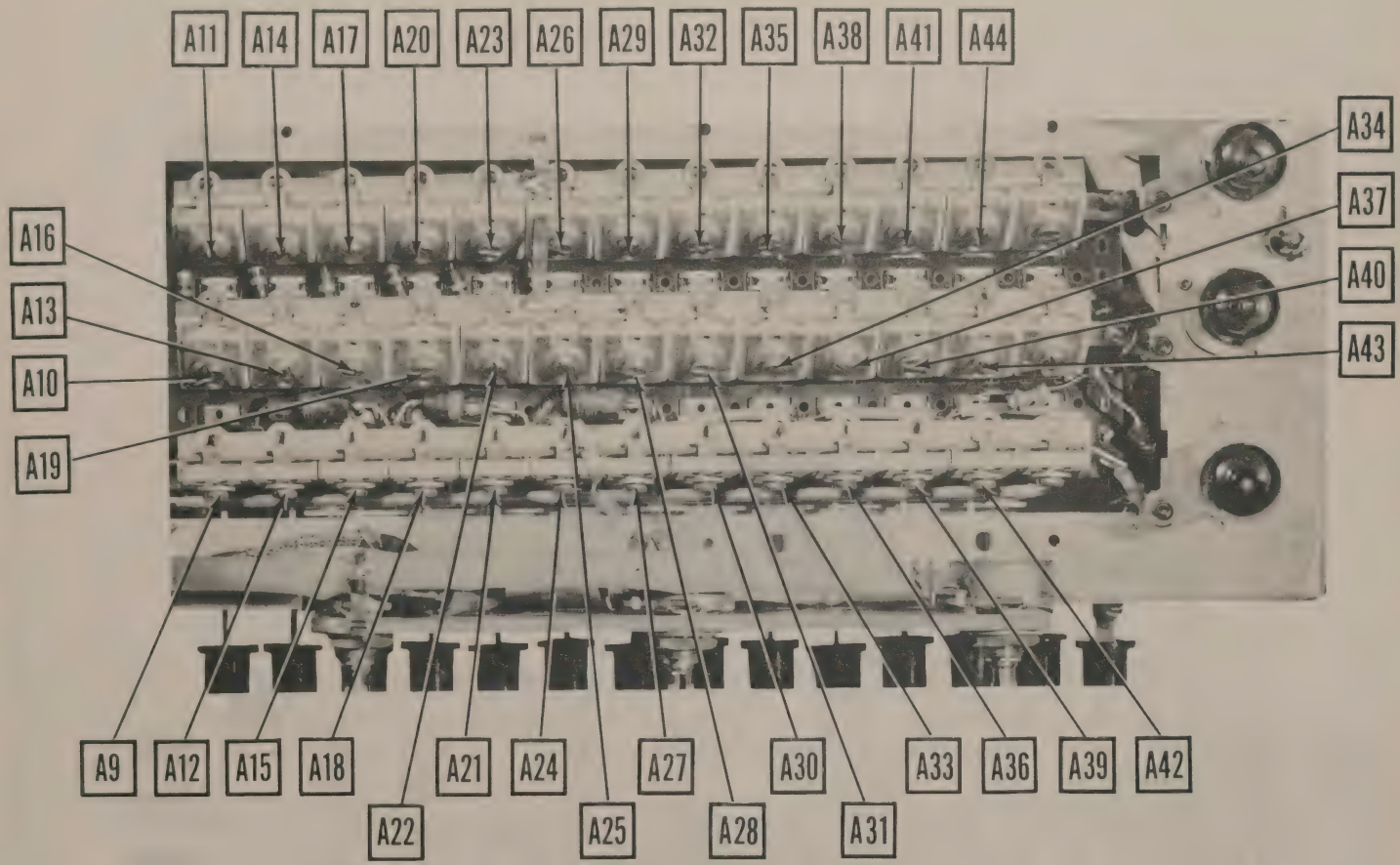
The optical components inside the projection unit are well protected, hence rarely require cleaning. Where it is essential to clean an optical surface inside the projection unit, the side plate may be removed to gain access to the optical surfaces.

Loose dust may be removed with a jet of clean dry air and a camel hair brush. Film on the optical surfaces may be removed with lens tissue and commercial cleaning solutions prepared especially for optical surfaces. These are available at most photographic supply houses. When cleaning the optical components inside the housing, also include the face of the projection tube. The face of the tube is an optical surface and must be cleaned with the same care given the concave mirror and diagonal mirror.

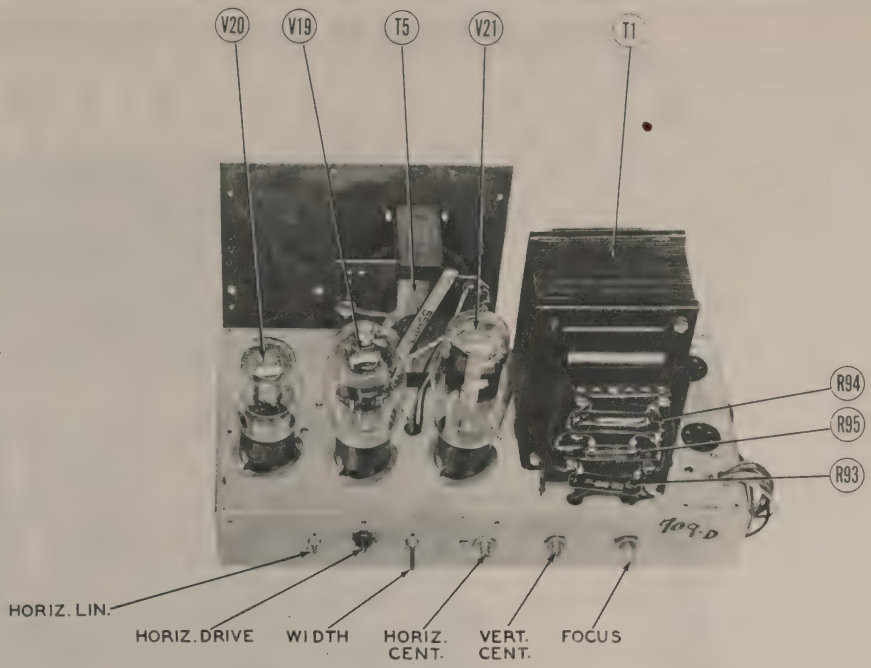
CAUTION: Do not loosen or remove the mounting screws or adjustment screws of the optical system inside the projection unit or remove the corrector lens or change its adjustment in any way. There is no simple way of adjusting this part of the optical system without special equipment.



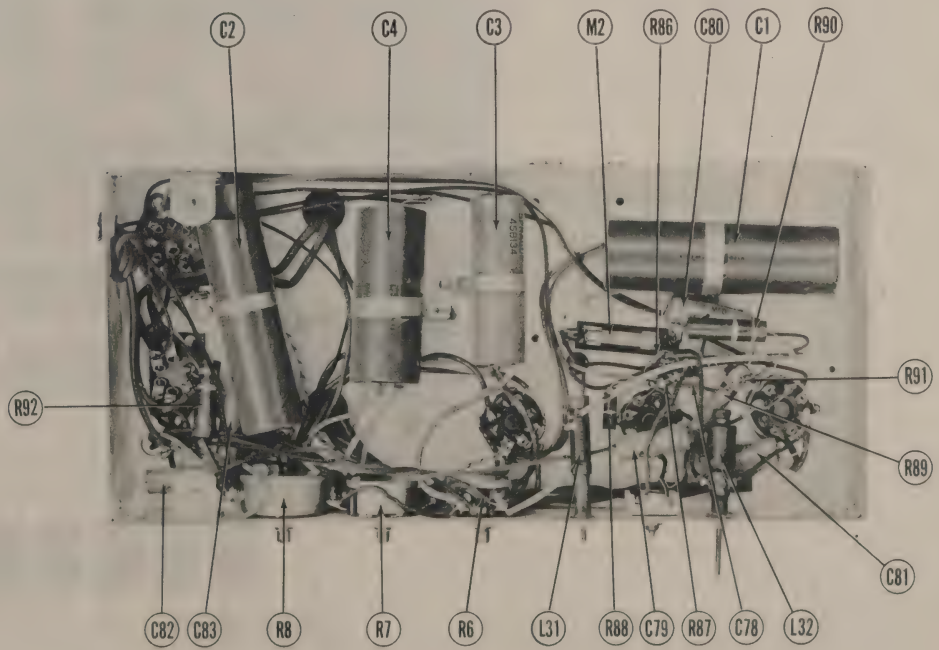

'OR AND ALIGNMENT IDENTIFICATION



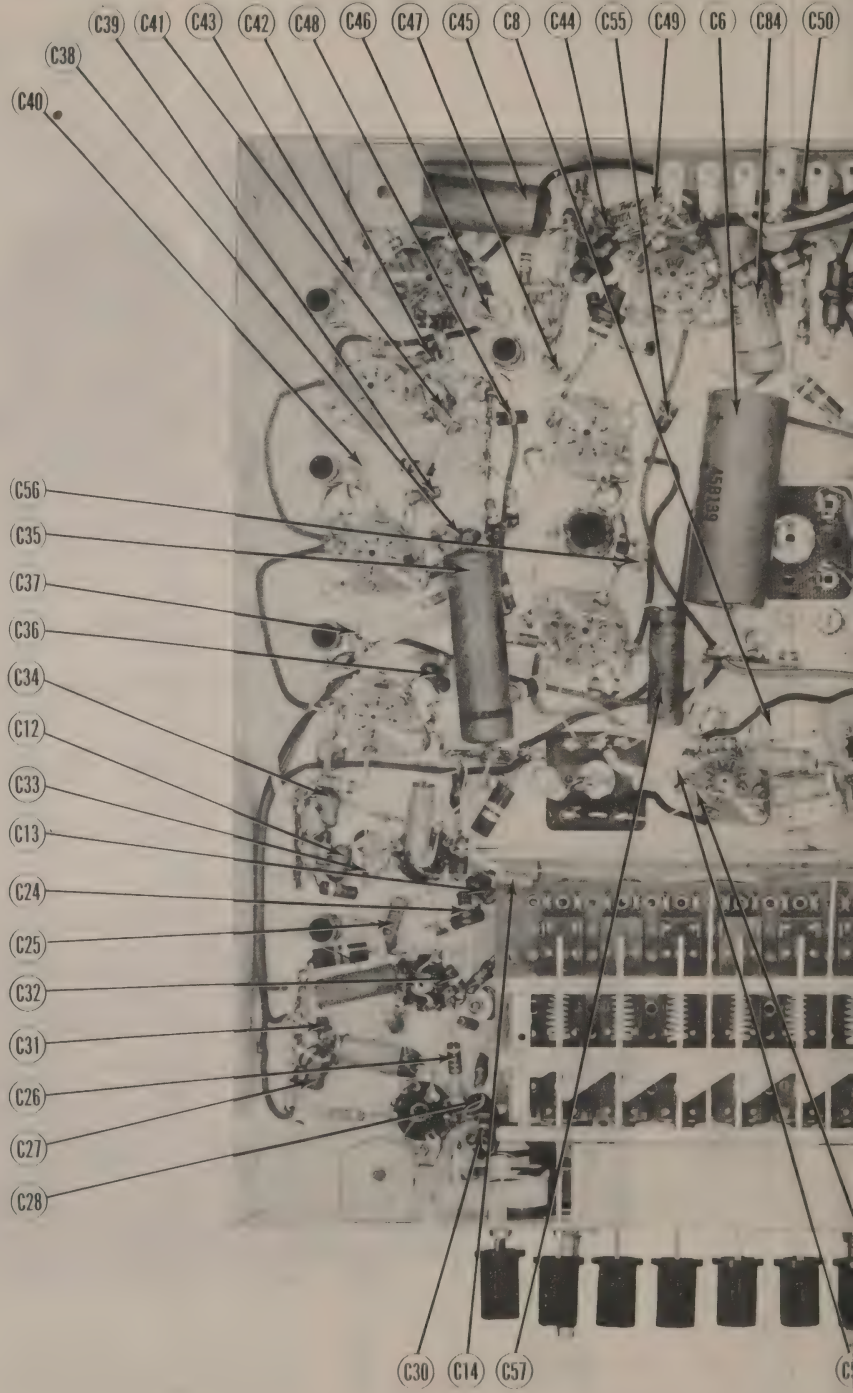

RF ALIGNMENT POINTS



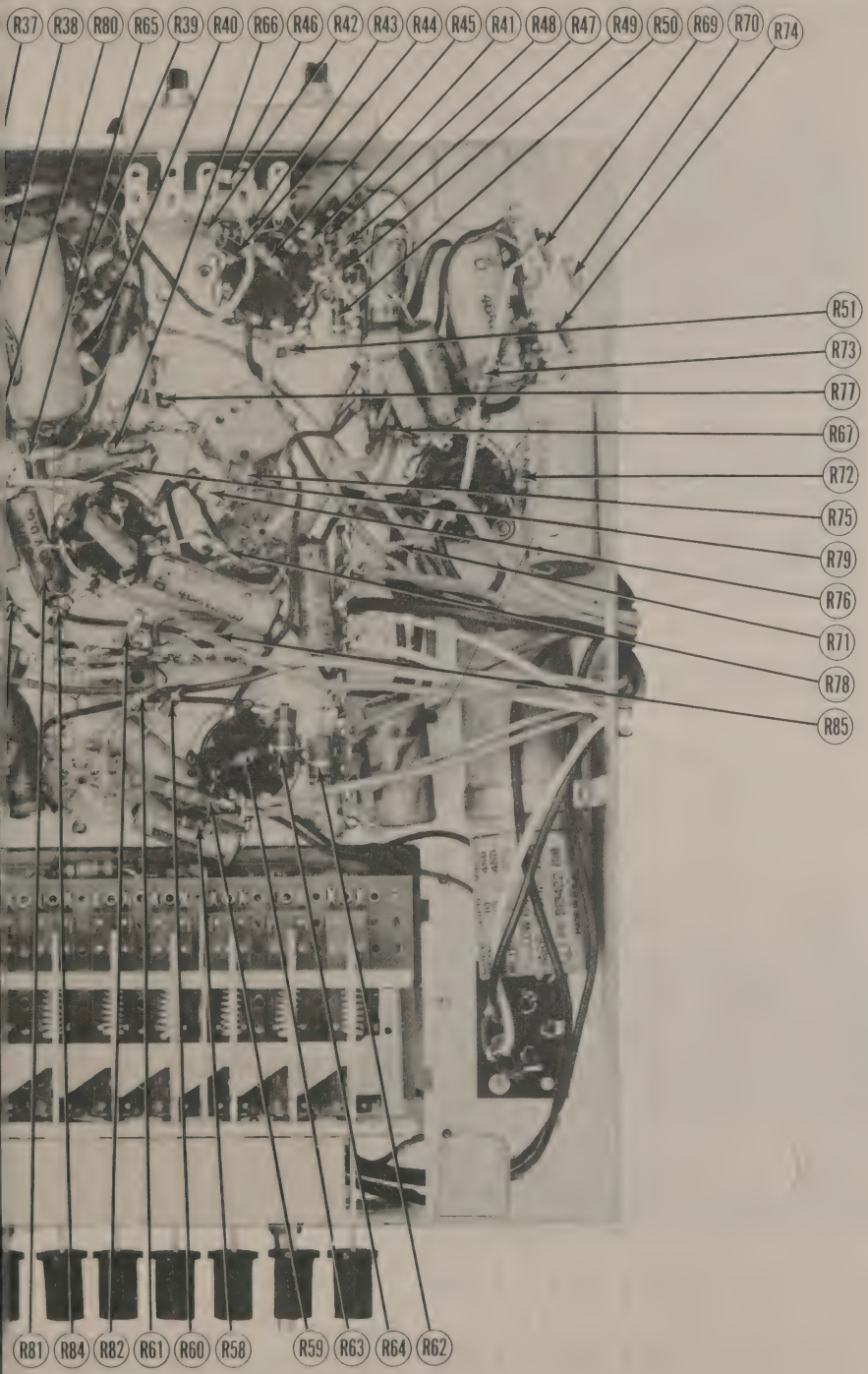

POWER SUPPLY CHASSIS-TOP VIEW




POWER SUPPLY CHASSIS-BOTTOM VIEW




CHASSIS BOTTOM VIEW-C




SISTOR IDENTIFICATION

# VOLTAGE AND RESISTANCE MEASUREMENTS

## VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Cap |
|---|---|---|---|---|---|---|---|---|---|---|
| V 1 | [illegible] | -.[illegible]VDC | .[illegible]VDC | [illegible].[illegible]VAC | 0V | 110VDC | 110VDC | .6VDC | | |
| V 2 | [illegible] | -1[illegible] | 0V | 0V | 6.3VAC | 70VDC | 70VDC | 0V | | |
| V 3 | [illegible] | [illegible] | 0V | 0V | 6.3VAC | 1[illegible]VDC | 8-8.8VDC | 0V | | |
| V 4 | [illegible] | -.[illegible]VDC | 0V | 6.3VAC | 0V | 11[illegible]VDC | 110VDC | 0V | | |
| V 5 | [illegible] | -.[illegible]VDC | 0V | 6.3VAC | 0V | 110VDC | 110VDC | .3VDC | | |
| V 6 | [illegible] | -.[illegible]VDC | 0V | 6.3VAC | 0V | 110VDC | 110VDC | .3VDC | | |
| V 7 | [illegible] | -.[illegible]VDC | 0V | 6.3VAC | 0V | 85VDC | 110VDC | .4VDC | | |
| V 8 | [illegible] | 0V | 0V | 6.3VAC | 0V | .6VDC | 0V | -1VDC | | |
| V 9 | [illegible] | 0V | 0V | 6.3VAC | 0V | 178VDC | 120VDC | 3VDC | | |
| V 10 | [illegible] | 0V | 0V | 255VDC | 335VDC | 0V | 0V | 6.3VAC | 17VDC | |
| V 11 | [illegible] | 0V | 21VDC | .8VDC | 0V | 110VDC | 4.8VDC | 6.3VAC | 0V | |
| V 12 | [illegible] | -.8VDC | 0V | 6.3VAC | 0V | 26VDC | 26VDC | 0V | | |
| V 13 | [illegible] | .1VDC | .1VDC | 6.3VAC | 0V | .2VDC | 0V | -.2VDC | | |
| V 14 | [illegible] | 0V | 0V | 6.3VAC | 0V | 75VDC | 15VDC | 1VDC | | |
| V 15 | [illegible] | 0V | 21 [illegible] | 18[illegible] | 200VDC | 0V | 0V | 6.3VAC | 13.5VDC | |
| V 16 | [illegible] | -2.4VDC | 13[illegible] | 0V | 0V | 335VDC | 8.8VDC<br>16VDC | 6.3VAC | 0V | |
| V 17 | [illegible] | 0V | 0V | 6.3VAC | 0V | 1VDC | 0V | -.7VDC | | |
| V 18 | [illegible] | -4.2VDC | 1[illegible] | 11VDC | 0V | 320VDC | 11VDC | 6.3VAC | 0V | |
| V 19 | [illegible] | 0V | 6.3VAC | 6VDC | 0V | -.9VDC | 0V | 0V | 290VDC | ‡ |
| V 20 | [illegible] | 0V | 6.3VAC | 0V | 0V | 350VDC | 0V | 350VDC | 420VDC | |
| V 21 | [illegible] | 0V | 4[illegible]VDC | 0V | 0V | 390VAC | 0V | 380VAC | 400VDC | |
| V 22 | [illegible] | 0V | -[illegible]VDC | 80VDC | -125VDC | -125VDC | 340VDC | 6.3VAC | 0V | |
| V 23 | [illegible] | -1[illegible]VDC | 6.3VAC | 11VDC | -104VDC | -100VDC | -125VDC | 0V | 340VDC | ‡ |
| V 24 | 3NP4 | .6VDC | 6.3VAC | 0V | 0V | 95VDC | | | | |

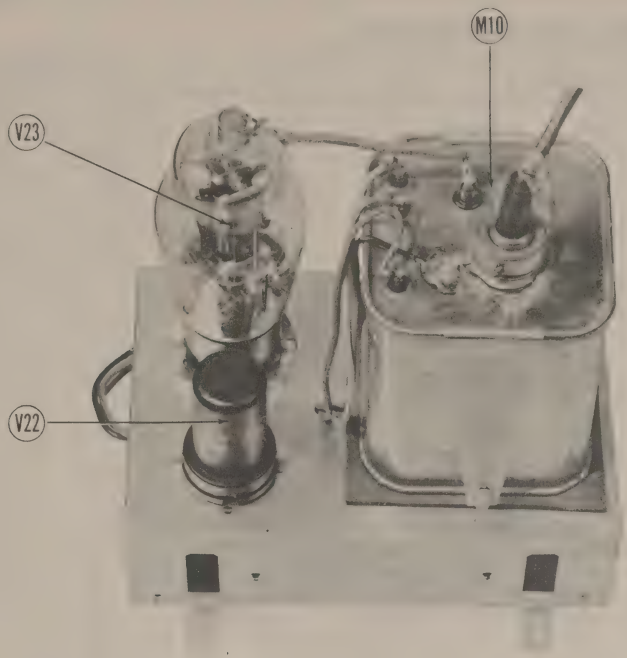
‡ Do not measure

## RESISTANCE READINGS

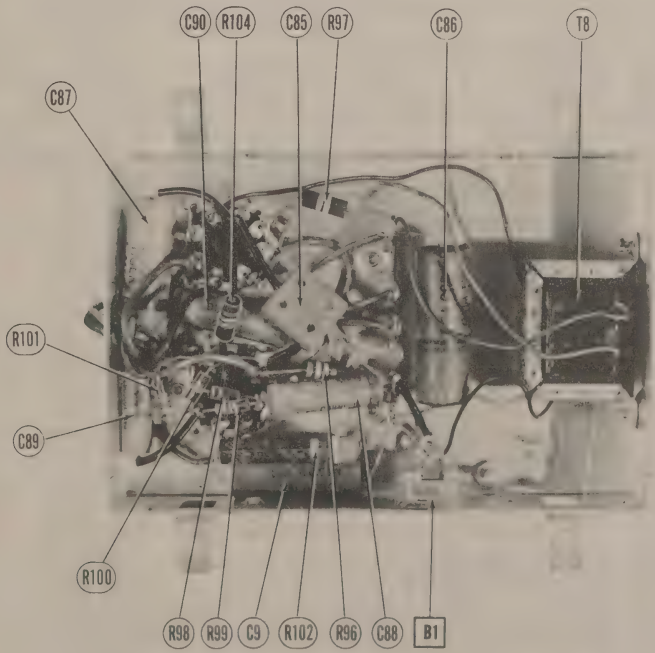
| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Cap |
|---|---|---|---|---|---|---|---|---|---|---|
| V 1 | 6AK5 | 3[illegible]KΩ | [illegible]Ω | .2Ω | 0Ω | *19KΩ | *19[illegible]Ω | [illegible]Ω | | |
| V 2 | 6AK5 | 1 Meg. | 0Ω | 0Ω | .2Ω | *15[illegible]Ω | *1.[illegible]Ω | 0Ω | | |
| V 3 | 6C24 | *6[illegible]Ω | Inf. | .1Ω | .2Ω | *8[illegible]Ω | 2C[illegible]Ω | 2Ω | | |
| V 4 | 6AC8 | 7[illegible]KΩ | 0Ω | .2Ω | 0Ω | *3.[illegible]KΩ | *3.5KΩ | 0Ω | | |
| V 5 | 6AU6 | 65[illegible]Ω | 0Ω | .2Ω | 0Ω | *2.[illegible]KΩ | *3.5KΩ | 68Ω | | |
| V 6 | 6AU6 | 800KΩ | 0Ω | .2Ω | 0Ω | *8.5KΩ | *3.[illegible]KΩ | 68Ω | | |
| V 7 | 6AU6 | 700KΩ | 0Ω | .2Ω | 0Ω | *14KΩ | *6.5KΩ | 68Ω | | |
| V 8 | 6AL5 | .1Ω | 0Ω | .2Ω | 0Ω | Inf. | 0Ω | 0KΩ | | |
| V 9 | 6AU6 | 1 Meg. | 0Ω | .2Ω | 0Ω | *6KΩ | *4.5KΩ | 2.5KΩ | | |
| V 10 | 6V6GT | Inf. | 0Ω | *5KΩ | *5KΩ | 1 Meg. | Inf. | .2Ω | 68Ω | |
| V 11 | 6SN7GT | 0Ω | *14KΩ | 270KΩ | 1 Meg. | *13KΩ | 3.9Ω | .2Ω | 0Ω | |
| V 12 | 6AU6 | 150KΩ | 0Ω | .2Ω | 0Ω | *20KΩ | *20KΩ | 0Ω | | |
| V 13 | 6AL5 | Inf. | Inf. | .2Ω | 0Ω | 9Ω | 0Ω | 9KΩ | | |
| V 14 | 6AU6 | 0Ω | 0Ω | .2Ω | 0Ω | *470KΩ | *2.2Meg. | 300Ω | | |
| V 15 | 6K6GT | 0Ω | 0Ω | *2.5KΩ | *2KΩ | 470KΩ | Inf. | .2Ω | 680Ω | |
| V 16 | 6SN7GT | 1.8 Meg. | †2.8 Meg<br>†1.2 Meg | 0Ω | 2.2Meg. | *1000Ω | 5.5KΩ<br>540Ω | .2Ω | 0Ω | |
| V 17 | 6AL5 | 5.6KΩ | 5.6KΩ | .2Ω | 0Ω | 4.7 Meg | 0Ω | 4.7Meg. | | |
| V 18 | 6SK7GT | 110KΩ | 1270KΩ | 1000Ω | 5 Meg. | 19KΩ | 1000Ω | .2Ω | 0Ω | |
| V 19 | 6SG8G | Inf. | .2Ω | 82Ω | Inf. | 1 Meg. | Inf. | 0Ω | *5KΩ | †150Ω |
| V 20 | 5V4G | 1Ω | Inf. | *240Ω | Inf. | *240Ω | Inf. | †0Ω | | |
| V 21 | 5U4G | Inf. | 20KΩ | Inf. | 32Ω | Inf. | 30Ω | Inf. | 20KΩ | |
| V 22 | 6SR7 | 0Ω | 400KΩ | 16KΩ | 250KΩ | 250KΩ | *350Ω | .2Ω | 0Ω | |
| V 23 | 6B6G | 540KΩ | .2Ω | 350Ω | 240KΩ | 560KΩ | 260KΩ | 0Ω | *200Ω | *480Ω |
| V 24 | 3NP4 | 340KΩ | .2Ω | 0Ω | 0Ω | 30KΩ | | | | |

* Measured from pin 2 of V21
† Measured from pin 8 of V20

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.




HIGH VOLTAGE SUPPLY-TOP VIEW




HIGH VOLTAGE SUPPLY-BOTTOM VIEW

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: HALLICRAFT. PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| V1A | RF Amp. | 6AK5 | 6AK5 | 7SD | |
| V2 | RF Amp. | 6AG5 | 6AG5 | 7SD | |
| V2A | Mixer | 6AK5 | 6AK5 | 7SD | |
| V3 | Mixer | 6AG5 | 6AG5 | 7SD | |
| V4 | Oscillator | 6C4 | 6C4 | 6BG | |
| V5 | 1st IF Amp. | 6AU6 | 6AU6 | 7SK | |
| V6 | 2nd IF Amp. | 6AU6 | 6AU6 | 7SK | |
| V7 | 3rd IF Amp. | 6AU6 | 6AU6 | 7SK | |
| V8 | 4th IF Amp. | 6AU6 | 6AU6 | 7SK | |
| V9 | Video Det.-AGC | 6AL5 | 6AL5 | 6ST | |
| V10 | Video Amp. | 6AU6 | 6AU6 | 7SK | |
| V11A | Video Output | 6V6GT | 6V6GT | 7AC | |
| B | Video Output | 6AQ5 | 6AQ5 | 7BZ | |
| V11A | DC Res.-Sync. Sep.-Sync.Phase Inv. | 6SN7GT | 6SN7GT | 8BD | |
| B | DC Rest.-Sync. Sep.-Sync.Phase Inv. | 12AU7 | 12AU7 | 9A | |
| V12 | Sound IF | 6AU6 | 6AU6 | 7SK | |
| V13 | Ratio Det. | 6AL5 | 6AL5 | 6ST | |
| V14 | AF Amp. | 6AV6 | 6AV6 | 7SK | |
| V15 | Audio Output | 6K6GT | 6K6GT | 7S | |
| V16 | Vert.Osc.-Vert. Amp. | 6SN7GT | 6SN7GT | 8SD | |
| V17 | Hor. Sync. Disc | 6AL5 | 6AL5 | 6ST | |
| V18 | Hor. Osc. | 6SN7GT | 6SN7GT | 8BD | |
| V19 | Hor. Output | 6BG6G | 6BG6G | 5BT | |
| V20 | Damper | 5V4G | 5V4G | 5L | |
| V21 | LV Rect. | 5U4G | 5U4G | 5T | |
| V22 | HV Osc. | 6SR7 | 6SR7 | 8Q | |
| V23 | HV Amp. | 6BG6G | 6BG6G | 5BT | |
| V24 | Projection Tube | 3BP4 | 3BP4 | | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: HALLICRAFT. PART No. | REPLACEMENT DATA: AEROVOX PART No. | REPLACEMENT DATA: CORNELL-DUBILIER PART No. | REPLACEMENT DATA: ERIE PART No. | REPLACEMENT DATA: SOLAR PART No. | REPLACEMENT DATA: SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | 40 | 450 | 45B137 | PRSA475/ 40-40 | UP4445 | | | TVL-64† | Filter Red |
| B | 40 | 450 | | | | | | | " " |
| C2 | 80 | 450 | 45B136 | PRSA475/80 | EZ10074 | | | TVL-94 | " |
| C3A | 250 | 10 | 45B134 | PRS12/250 | EZ10095 | | | TVL-66† | Hor. Cent. Cont. Byp. |
| B | 1000 | 6 | | PRS6/1000 | | | | | Vert. Cent. Cont. Byp. |
| C4A | 40 | 350 | 45B138 | PRSA8D8H6F | EDJ 10106 | | | TVL-54† | Filter Red |
| B | 30 | 250 | | | | | | | Filter Yellow |
| C | 40 | 150 | | | | | | | Filter Blue |
| C5A | 10 | 450 | 45B135 | PRSA475/10-10-50/150 | EZ10090 | | | D13422 | Filter Red |
| B | 10 | 450 | | | | | | | " " |
| C | 10 | 450 | | | | | | | " " |
| D | 150 | 50 | | | | | | | Vert. Amp.Cath. Byp. Yel. |
| C6A | 8 | 300 | 45B139 | PRS450/8-8 | EDL8845 | | | TVA-25 | Filter |
| B | 8 | 300 | | | | | | | " |
| C7 | 10 | 25 | 45A121 | PRS25/10 | BR102A | | | TVA-5 | Output Cath. Bypass |
| C8 | 5 | 50 | 45-109 | PRS150/4 | BR550 | | | TVA-13 | Stabilizing Cap. |
| C9 | 20 | 50 | 45A089 | PRS50/25 | BR205 | | | TVA-15 | H.V. Amp. Cath. Bypass |
| C10 | 100 | | 47B20101K5 | 1468-0001 | 5W5T1 | GP1K-100 | MO.5-31 | 1FM-31 | RF Coupling |
| C11 | 100 | | 47B20101K5 | 1468-0001 | 5W5T1 | GP1K-100 | MO.5-31 | 1FM-31 | " " |
| C12 | 1000 | | 47B20A102NI | 1468-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | AGC Filter |
| C13 | 1000 | | 47B20A102NI | 1468-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | RF Decoupling |
| C14 | 39 | | 47B20390K5 | 1468-00004 | 5W5Q4 | | MO.5-44 | 1FM-44 | RF Coupling |
| C15 | 4.7 | | 47A160-6 | | | NPGK-5 | | | Fixed Padder |
| C16 | 2.2 | | 47A160-4 | | | | | | RF Coupling |
| C17 | 4.7 | | 47A160-6 | | | NPGK-5 | | | " " |
| C18 | 3.3 | | 47A160-5 | | | | | | " " |
| C19 | 4.7 | | 47A160-6 | | | NPGK-5 | | | " " |
| C20 | 3.3 | | 47A160-5 | | | | | | " " |
| C21 | 39 | | 47B20390K5 | 1468-00004 | 5W5Q4 | | MO.5-44 | 1FM-44 | " " |
| C22 | 4.7 | | 47A160-6 | | | NPGK-5 | | | Fixed Padder |
| C23 | 1.5 | | 47A160-3 | | | NPGK-1.5 | | | Osc. Coupling |
| C24 | 1.5 | | 47A160-3 | | | NPGK-1.5 | | | RF Coupling |
| C25 | 1000 | | 47B20A102NI | 1468-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | Mixer Decoupling |
| C26 | .68 | | 47A160-1 | | | | | | Osc. Coupling |
| C27 | 1000 | | 47B20A102NI | 1468-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | RF Bypass |
| C28 | 1000 | | 47B20A102NI | 1468-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | Osc. Plate Bypass |
| C29 | 39 | | 47B20390K5 | 1468-00004 | 5W5Q4 | | MO.5-44 | 1FM-44 | Osc. Grid Cap. |
| C30 | 4.7 | | 47A160-6 | | | NPGK-5 | | | Fixed Padder |
| C31 | 1000 | | 47B20A102NI | 1468-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | Osc. Fil. Bypass |
| C32 | 2.2 | | 47A160-4 | | | | | | Fixed Trimmer * |
| C33 | 100 | | 47B20101K5 | 1468-0001 | 5W5T1 | GP1K-100 | MO.5-31 | 1FM-31 | IF Coupling |
| C34 | 1000 | | 47B20A102NI | 1468-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | AGC Filter |
| C35 | 25 | 200 | 45A124A | PRS25-25 | UT2F25 | | ST-2-25 | TC-2 | " |
| C36 | 1000 | | 47B20A102NI | 1468-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | 1st IF Decoupling |
| C37 | 100 | | 47B20101K5 | 1468-0001 | 5W5T1 | GP1K-100 | MO.5-31 | 1FM-31 | IF Coupling |
| C38 | 1000 | | 47B20A102NI | 1468-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | AGC Filter |
| C39 | 1000 | | 47B20A102NI | 1468-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | 2nd IF Decoupling |
| C40 | 100 | | 47B20101K5 | 1468-0001 | 5W5T1 | GP1K-100 | MO.5-31 | 1FM-31 | IF Coupling |
| C41 | 1000 | | 47B20A102NI | 1468-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | AGC Filter |
| C42 | 1000 | | 47B20A102NI | 1468-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | 3rd IF Decoupling |
| C43 | 100 | | 47B20101K5 | 1468-0001 | 5W5T1 | GP1K-100 | MO.5-31 | 1FM-31 | IF Coupling |
| C44 | 1000 | | 47B20A102NI | 1468-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | AGC Filter |
| C45 | .25 | 200 | 46A124AJ | PRS25-25 | UT2F25 | | ST-2-25 | TC-2 | " |
| C46 | 5000 | | 47A168 | 1467-005 | 1DD5 | GP2M-005 | MW.5-25 | 1FM-25 | 4th IF Decoupling |
| C47 | 100 | | 47B20101K5 | 1468-0001 | 5W5T1 | GP1K-100 | MO.5-31 | 1FM-31 | IF Coupling |
| C48 | 10 | | 47A160-11 | 1468-00001 | 5W5Q1 | GP1K-10 | MO.5-41 | MS-41 | Diode Filter |
| C49 | .68 | 200 | 46A8G8J | PR68-05 | UT6S5 | | ST-4-05 | TM-15 | Video Coupling |
| C50 | .05 | 600 | 46AY503J | P688-05 | GT6S5 | | ST-6-05 | TM-15 | " " |
| C51 | 470 | 500 | | 1468-0005 | 5W5T5 | GP2K-500 | MO.5-35 | 1FM-35 | 2nd V. Amp. Cath. Byp. |
| C52 | .1 | 600 | 46AY104J | P68-1 | UT6F1 | | ST-6-1 | TM-1 | Video Coupling |
| C53 | .25 | 600 | 46AX254J | 684-25 | GT6P25 | | ST-6-25 | TC-2 | " " |
| C54 | .05 | 600 | 46AY503J | P688-05 | GT6S5 | | ST-6-05 | TM-15 | Sync. Coupling |
| C55 | 1.5 | | 47A160-3 | | | NPGK-1.5 | | | S. IF Coupling |

* Used only in models using 6AK5 mixer tube.
† When either item C3B or C5B are replaced, repla
§ Not used in all models.
‡ Use mounting strap.

## CAPACITO

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT: HALLICRAFT PART No. | REPLACEMENT: AEROVOX PART No. | REPLACEMENT: CORNELL-DUBILIER PART No. | |
|---|---|---|---|---|---|---|
| C56 | 100 | | 47B20101K5 | 1468-0001 | 5W5T1 | 5F |
| C57 | .01 | 400 | 46A0103J | P468-01 | GT4S1 | GF |
| C58 | 330 | | 47B20331K5 | 1468-0003 | 5W5T3 | GF |
| C58 | 330 | | 47B20331K5 | 1468-0003 | 5W5T3 | GF |
| C59 | 1000 | | 47B20A102NI | 1468-001 | 1W5D1 | GF |
| C61 | .01 | 400 | 46AA103J | P488-01 | GT4S1 | GF |
| C62 | .01 | 600 | 46AZ103J | P688-01 | GT6S1 | GF |
| C63 | .01 | 600 | 46AZ103J | P688-01 | GT6S1 | GF |
| C64 | .01 | 600 | 46AZ103J | P688-01 | GT6S1 | GF |
| C65 | .002 | 600 | 46AZ202J | P688-002 | GT6S2 | GF |
| C66 | .005 | 600 | 46AZ502J | P688-005 | GT6S5 | GF |
| C67 | 4700 | 500 | CM35A472K | | | |
| C68 | .1 | 600 | 46AY104J | P688-1 | GT6F1 | |
| C69 | .25 | 600 | 46AY254J | 684-25 | GT6P25 | |
| C70 | 1500 | 500 | CM35A152K | 1467-0015 | 1W5C15 | GF |
| C71 | 1500 | 500 | CM35A152K | 1467-0015 | 1W5C15 | GF |
| C72 | .02 | 600 | 46AY203J | P688-02 | GT6S2 | |
| C73 | .005 | 600 | 46AZ502J | P688-005 | GT6S5 | GF |
| C74 | .005 | 600 | 46AZ502J | P688-005 | GT6S5 | GF |
| C75 | .005 | 600 | 46AZ502J | P688-005 | GT6S5 | GF |
| C76 | 330 | 500 | CM20A331K | 1468-0003 | 5W5T3 | GF |
| C77 | 330 | | 47B20391K5 | 1468-0004 | 5W5T4 | |
| C78 | 390 | 500 | CM20A391M | 1468-0004 | 5W5T4 | |
| C79 | .01 | 600 | 46AZ103J | P688-01 | GT6S1 | GF |
| C80 | .033 | 600 | 46AY333J | P688-033 | | |
| C81 | .1 | 600 | 46AY104J | P689-1 | GT6F1 | |
| C82 | .01 | 600 | 46BR103L6 | P688-01 | GT6S1 | GF |
| C83 | .01 | 600 | 46BR103L6 | P688-01 | GT6S1 | GF |
| C84 | .1 | 200 | 46AU104J | P288-1 | GT2F1 | |
| C85 | 2700 | 500 | CM30A272J | | | |
| C86 | .1 | 600 | 46AY104J | P688-1 | GT6F1 | |
| C87 | .1 | 400 | 46AY104J | P488-1 | GT4F1 | |
| C88 | .01 | 600 | 46AZ103J | P688-01 | GT6S1 | GF |
| C89 | .015 | 400 | | P488-015 | GT6S15 | |
| C90 | .03 | 400 | 46AW303J | P488-03 | GT4S3 | |
| C91 | 6800 | 500 | CM35A682J | | | |
| C92 | 470 | 500 | | 1468-0005 | 5W5T5 | GF |

## CONT

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: HALLICRAFT. PART No. | REPLACEMENT DATA: IRC PART No. | REPLACEMENT DATA: CLAROS PART |
|---|---|---|---|---|---|
| R1A | 50KΩ | ½ | 25B798 | | |
| B | 1 Meg. | ½ | | | |
| R2 | 2500Ω | 1 | 25B789 | | |
| R3A | 50KΩ | ½ | 25B787 | | |
| B | 1 Meg. | ½ | | | |
| R4A | 5000Ω | ½ | 25B769 | D11-114 | AM-19-S |
| B | Shaft | | Not Req. | E | KSP-3 |
| R5A | 2.5 Meg. | ½ | 25B768 | | AM-83-S |
| B | Shaft | | Not Req. | | KSP-3 |
| R6 | 20Ω | 2 | 25B707 | W-20 | 43-20 |
| R7 | 2Ω | 2 | 25B706 | W-20x10 | 43-20CT |
| R8 | 500Ω | 4 | 25B709 | W-500 | 98-500 |

## RESI

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: HALLICRAFT. PART No. | REPLACEMENT DATA: IRC PART No. |
|---|---|---|---|---|
| R9 | 150Ω | ½ | RC20AE151K | |
| R10 | 150Ω | ½ | RC20AE151K | |
| R11 | 10KΩ | ½ | RC20AE103K | |
| R12 | 15KΩ | 1 | RC30AE153K | BTA-15K |
| R13 | 1 Meg. | ½ | RC20AE105M | |
| R14 | 10KΩ | 1 | RC30AE103K | BTA-10K |
| R15 | 2200Ω | ½ | RC20AE222K | BTS-2200 |
| R16 | 22KΩ | ½ | RC20AE223K | BTS-22K |
| R17 | 100KΩ | ½ | RC20AE104K | BTS-100K |
| R18 | 100KΩ | ½ | RC20AE104K | BTS-100K |
| R19 | 100KΩ | ½ | RC20AE104K | BTS-100K |
| R20 | 100KΩ | ½ | RC20AE104K | BTS-100K |
| R21 | 470KΩ | ½ | RC20AE474K | BTS-470K |
| R22 | 22KΩ | ½ | RC20AE223K | |
| R23 | 2200Ω | ½ | RC20AE222K | BTS-2200 |
| R24 | 5600Ω | ½ | RC20AE562K | BTS-5600 |
| R25 | 2200Ω | ½ | RC20AE222K | BTS-2200 |
| R26 | 68Ω | ½ | RC20AE680K | |
| R27 | 8200Ω | ½ | RC20AE822K | |
| R28 | 68Ω | ½ | RC20AE680K | |
| R29 | 2200Ω | ½ | RC20AE222K | BTS-2200 |
| R30 | 5600Ω | ½ | RC20AE562K | BTS-5600 |
| R31 | 68Ω | ½ | RC20AE680K | |
| R32 | 8200Ω | ½ | RC20AE822K | BTS-8200 |
| R33 | 2200Ω | ½ | RC20AE222K | BTS-2200 |
| R34 | 2200Ω | ½ | RC20AE204K | BTS-200K |
| R35 | 5600Ω | ½ | RC20AE562K | BTS-5600 |
| R36 | 1 Meg. | ½ | RC20AE105M | BTS-1 Meg. |
| R37 | 33000Ω | 1 | RC30AE332K | BTA-3300 |
| R38 | 1 Meg. | ½ | RC20AE105M | BTS-1 Meg. |
| R39 | 680Ω | ½ | RC20AE681K | BTS-680 |
| R40 | 47000Ω | 2 | RC40AE472K | BT-2-4700 |
| R41 | 47KΩ | ½ | RC20AE473K | BTS-47K |
| R42 | 27KΩ | ½ | RC20AE273K | BTS-27K |
| R43 | 270KΩ | ½ | RC20AE274K | BTS-270K |
| R44 | 1 Meg. | ½ | RC20AE105M | BTS-1 Meg. |
| R45 | 2000Ω | ½ | RC20AE202K | BTS-2000 |
| R46 | 3900Ω | ½ | RC20AE392K | BTS-3900 |
| R47 | 15KΩ | ½ | RC20AE153K | BTS-15K |
| R48 | 8200Ω | ½ | RC20AE822K | BTS-8200 |
| R49 | 8200Ω | ½ | RC20AE822K | BTS-8200 |
| R50 | 1 Meg. | ½ | RC20AE105M | BTS-1 Meg. |
| R51 | 3900Ω | ½ | RC20AE392K | BTS-3900 |
| R52 | 150KΩ | ½ | RC20AE154K | |

# CRIPTIONS

| o. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|
| ) | MO.5-31 | 1FM-31 | S. IF Coupling |
| -01 | ST-4-01 | TM-11 | S. IF Decoupling |
| ) | MO.5-33 | 1FM-33 | Diode Load Cap † |
| ) | MO.5-33 | 1FM-33 | " " " † |
| | MW.5-21 | 1FM-21 | De-emphasis |
| -01 | ST-4-01 | TM-11 | Audio Coupling |
| -01 | ST-4-01 | TM-11 | AF Screen Bypass |
| -01 | ST-4-1 | TM-11 | Audio Coupling |
| -01 | ST-4-01 | TM-11 | Output Plate Bypass § |
| | ST-6-002 | TM-22 | Integrator Net. |
| ) | ST-6-005 | TM-25 | " " " |
| | | | Vert. Osc. Grid Cap. |
| | ST-6-1 | TM-1 | Vert. Discharge |
| | ST-6-28 | TC-2 | Vert. Coupling |
| 5 | MW.5-215 | 1FM-215 | Hor. Sync. Coupling |
| 5 | MW.5-215 | 1FM-215 | " " " |
| | ST-6-02 | TM-12 | Voltage Divider |
| ) | ST-6-005 | TM-25 | AFC Feedback |
| ) | ST-6-005 | TM-25 | Hor. Sync. Coupling |
| ) | ST-6-005 | TM-25 | Hor. Osc. Grid Cap. |
| ) | MO.5-33 | 1FM-33 | Hor. Osc. Feedback |
| | MO.5-34 | 1FM-34 | Hor. Discharge |
| | MO.5-34 | 1FM-34 | Hor. Sync. Coupling |
| -01 | ST-6-01 | TM-11 | Hor. Amp. Screen Byp. |
| | | | Damper Filter |
| | ST-6-1 | TM-1 | " " |
| -01 | ST-6-1 | TM-11 | Line Filter |
| -01 | ST-6-01 | TM-11 | " " |
| | ST-2-1 | TM-1 | Pic. Tube Cath. Dec. |
| | | | H.V. Osc. Grid Cap. |
| | ST-6-1 | TM-1 | RF Bypass |
| | ST-4-1 | TM-1 | H.V. Osc. Cath. Dec. |
| -01 | ST-6-01 | TM-11 | H.V.Osc. Coupling |
| | ST-4-02 | TM-12 | Bias Filter |
| | ST-6-03 | TM-13 | " " |
| | | | Fixed Trimmer |
| ) | MO.5-35 | 1FM-35 | AF Plate Bypass § |

h with capacitors of equal value.

S

| INSTALLATION NOTES |
|---|
| oriz. hold control } Dual concentric |
| ert. hold control. } |
| ontrast control and switch |
| rightness control } Dual concentric |
| olume control } |
| ert. Linearity control |
| ttach to R4A Per Instructions |
| eight control |
| ttach to R5A Per Instructions |
| oriz. centering control |
| ert. centering control tapped @ 10Ω |
| ocus control |

S

| IDENTIFICATION CODES |
|---|
| esistors ± 10% unless otherwise stated. |
| d |
| hode |
| te Coil Shunt |
| e Dropping |
| Grid |
| e Dropping |
| late |
| rid |
| twork |
| " |
| " |
| lter |
| Grid |
| Decoupling |
| Grid |
| Decoupling |
| Cathode |
| Grid |
| Cathode |
| Decoupling |
| Grid |
| Cathode |
| Plate |
| Decoupling |
| twork |
| Det. Load |
| Amp. Grid |
| Amp. Plate |
| Output Grid |
| Output Cathode |
| Output Plate |
| e Tube Grid |
| e Divider |
| ower Cathode |
| Amp. Plate |
| Phase Inv. Plate |
| " " |
| ator |
| ator |
| Phase Inv. Grid |
| Phase Inv. Cathode |
| IF Grid |

## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | HALLICRAFT. PART No. | IRC PART No. | |
| R53 | 12KΩ | ½ | RC20AE123K | BTS-12K | Voltage Divider |
| R54 | 30KΩ | ½ | RC20AE333K | BTS-33K | " " |
| R55 | 9100Ω | ½ | RC20AE103J♦ | BTS-10K-5%♦ | Ratio Det. Diode Load 5% |
| R56 | 9100Ω | ½ | RC20AE103J♦ | BTS-10K-5%♦ | " " " " 5% |
| R57 | 33KΩ | ½ | RC20AE333K | BTS-33K | De-emphasis |
| R58 | 330Ω | ½ | RC20AE331K | BTA-330 | AF Cathode |
| R59 | 68KΩ | 1 | RC30AE683K | BTA-68K | Voltage Divider |
| R60 | 2.2 Meg. | ½ | RC20AE225K | BTS-2.2 Meg. | AF Screen |
| R61 | 470KΩ | ½ | RC20AE474K | BTS-470K | AF Plate |
| R62 | 1000Ω | 1 | RC30AE102K | BTA-1000 | AF Decoupling |
| R63 | 470KΩ | ½ | RC20AE474K | BTS-470K | Output Grid |
| R64 | 680Ω | 1 | RC30AE681K | BTA-680 | Output Cathode |
| R65 | 47KΩ | ½ | RC20AE473K | BTS-47K | Voltage Divider |
| R66 | 5600Ω | ½ | RC20AE562K | BTS-5600 | " " |
| R67 | 1.2 Meg. | ½ | RC20AE125K | BTS-1.2 Meg. | Vert. Osc. Grid |
| R68 | 1.5 Meg. | ½ | RC20AE155K | BTS-1.5 Meg. | " " " |
| R69 | 100KΩ | ½ | RC20AE104K | BTS-100K | Voltage Divider |
| R70 | 6.8 Meg. | ½ | RC20AE685K | BTS-6.8 Meg. | " " |
| R71 | 560Ω | ½ | RC20AE561K | BTS-560 | Vert. Amp. Cathode |
| R72 | 2.2 Meg. | ½ | RC20AE225K | BTS-2.2 Meg. | Vert. Amp. Grid |
| R73 | 3300Ω | ½ | RC20AE332K | BTS-3300 | Vert. Peaking |
| R74 | 1.5 Meg. | ½ | RC20AE155K | BTS-1.5 Meg. | Vert. Osc. Plate |
| R75 | 100KΩ | ½ | RC20AE104K | BTS-100K-5% | Horiz. Sync. Disc. Load 5% |
| R76 | 100KΩ | ½ | RC20AE104K | BTS-100K-5% | " " " " " |
| R77 | 4.7 Meg. | ½ | RC20AE475K | BTS-4.7 Meg. | " " " " |
| R78 | 5600Ω | ½ | RC20AE562K | BTS-5600 | Feedback Network |
| R79 | 470KΩ | ½ | RC20AE474K | BTS-470K-5% | AFC Filter 5% |
| R80 | 5600Ω | ½ | RC20AE562K | BTS-5600 | Horiz. Osc. Plate |
| R81 | 1000Ω | ½ | RC20AE102K | BTS-1000 | Horiz. Osc. Cathode |
| R82 | 68KΩ | ½ | RC20AE683K | BTS-68K | Horiz. Osc. Grid |
| R83 | 270KΩ | ½ | RC20AE274K | BTS-270K | Horiz. Osc. Plate |
| R84 | 4700Ω | ½ | RC20AE472K | BTS-4700 | Horiz. Peaking |
| R85 | 2200Ω | ½ | RC20AE222K | BTS-2200 | Filter |
| R86 | 1 Meg. | ½ | RC20AE105M | BTS-1 Meg | Horiz. Output Grid |
| R87 | 472 | ½ | RC20AE470K | | Parasitic Suppressor |
| R88 | 82Ω | 1 | RC30AE820K | | Horiz. Output Cathode |
| R89 | 4700Ω | 2 | RC40AE472K | BT-2-4700 | Horiz. Output Screen |
| R90 | 1800Ω | 2 | RC40AE182K | BT-2-1800 | Filter |
| R91 | 8200Ω | 1 | RC30AE822K | BTA-8200 | Feedback Network |
| R92 | 1800Ω | 2 | RC40AE182K | BT-2-1800 | Focus Coil Shunt |
| R93 | 200Ω | 10 | 24BG201E | AB-200 | Series Focus Coil |
| R94 | 2000Ω | 20 | 24BH202E | DG-2000 | Filter |
| R95 | 2500Ω | 5 | 24HP252 | AB-2500 | " |
| R96 | 390KΩ | 1 | RC30AE394J | BTA-390K-5% | HV Osc. Grid 5% |
| R97 | 220KΩ | 1 | RC30AE224K | BTA-220K | HV Osc. Cathode |
| R98 | 330Ω | ½ | RC20AE331K | BTA-330 | Parasitic Suppressor |
| R99 | 330KΩ | ½ | RC20AE334K | BTS-330K | HV Amp. Grid |
| R100 | 220KΩ | ½ | RC20AE224K | BTS-220K-5% | Bias Network 5% |
| R101 | 47KΩ | ½ | RC20AE473K | BTS-47K-5% | Bias Filter 5% |
| R102 | 390Ω | 2 | RC40AE391K | BW-2-390 | HV Amp. Cathode |
| R103 | 1.5 Meg. | 1 | 23A075 | | HV Filter |
| R104 | 18KΩ | 1 | RC30AE183K | BTA-18K | Voltage Divider |

♦ If Item #R55 or R56 is replaced, replace both with resistors of equal value.

## TRANSFORMER (POWER)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | |
|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | SEC. 3 | HALLICRAFTERS PART No. | STANCOR PART No. | CHICAGO PART No. | MERIT PART No. |
| T1 | 117VAC @ 2.01A | 740VCT @ .245 ADC<br>SEC. 4<br>6.3VAC @ 8.1A | 5VAC @ 3A | 5VAC @ 2A | 52-170 | P-8153♦ | TP-410 | |

♦ Drill new mounting holes.

## TRANSFORMER (SWEEP CIRCUITS)

| ITEM No. | RATING | | REPLACEMENT DATA | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | DC RESISTANCE PRI. | DC RESISTANCE SEC. | HALLICRAFTERS PART No. | STANCOR PART No. | CHICAGO PART No. | MERIT PART No. | |
| T2 | 40Ω | | 50B411 | | | | Hor. Osc. Coil. |
| T3 | 200Ω | 1200Ω | 55115 | A-8111 | TBO-1 | A-3000 | Vert. Block Osc. XFMR |
| T4 | 91Ω | 142 Tap @ 2Ω | 55117 | | | | Hor. Output XFMR. |
| T5 | 590Ω | 7Ω | 55114 | A-8115 | TSO-1 | A-3035 | Vert. Output XFMR. |
| T6A | 15Ω | | | | | | Hor. Deflection Yoke |
| B | 6Ω | | | | | | Vert. Deflection Yoke |
| T7 | 290Ω | | | | | | Focus Coil |
| T8 | 145Ω | 200Ω | 52176 | | | | HV Osc. Transformer |

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE PRI. | IMPEDANCE SEC. | DC RES. PRI. | DC RES. SEC. | HALLICRAFT. PART No. | STANCOR PART No. | CHICAGO PART No. | MERIT PART No. | |
| T9 | 6.8KΩ | 3.2Ω | 280Ω | .4Ω | Part of 85C079-1 | A-8114 | RO-16 | A-2900 | |

## SPEAKER

| ITEM No. | RATING | | REPLACEMENT DATA | | | NOTES |
|---|---|---|---|---|---|---|
| | FIELD RES. | V. C. IMP. | HALLICRAFT. PART No. | JENSEN PART No. | QUAM PART No. | |
| SP1A | 2Ω | 3.2Ω | 85C362-1# | | 6A21 | # Used in model T-60 |
| B | 6Ω | 3.2Ω | 85C362†† | | | †† Used in model T-68 |
| | CONE DIA. | V. C. DIA. | | | | |
| SP2A | 5 3/4" | 9/16" | | | | |
| SP2B | | | | | | |

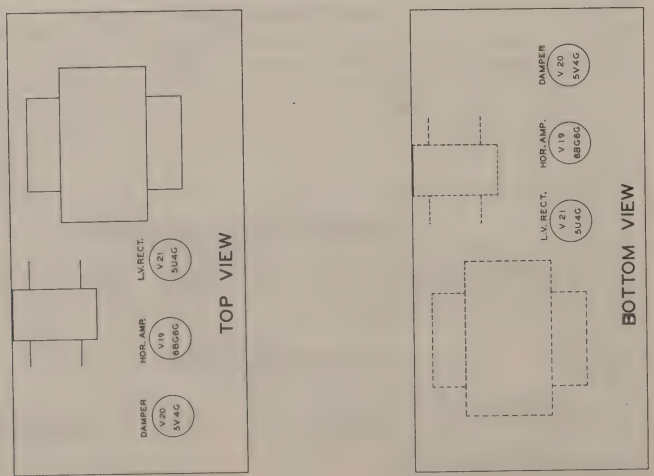
# PARTS LIST AND DESCRIPTIONS (Continued)

## COILS (RF-IF)

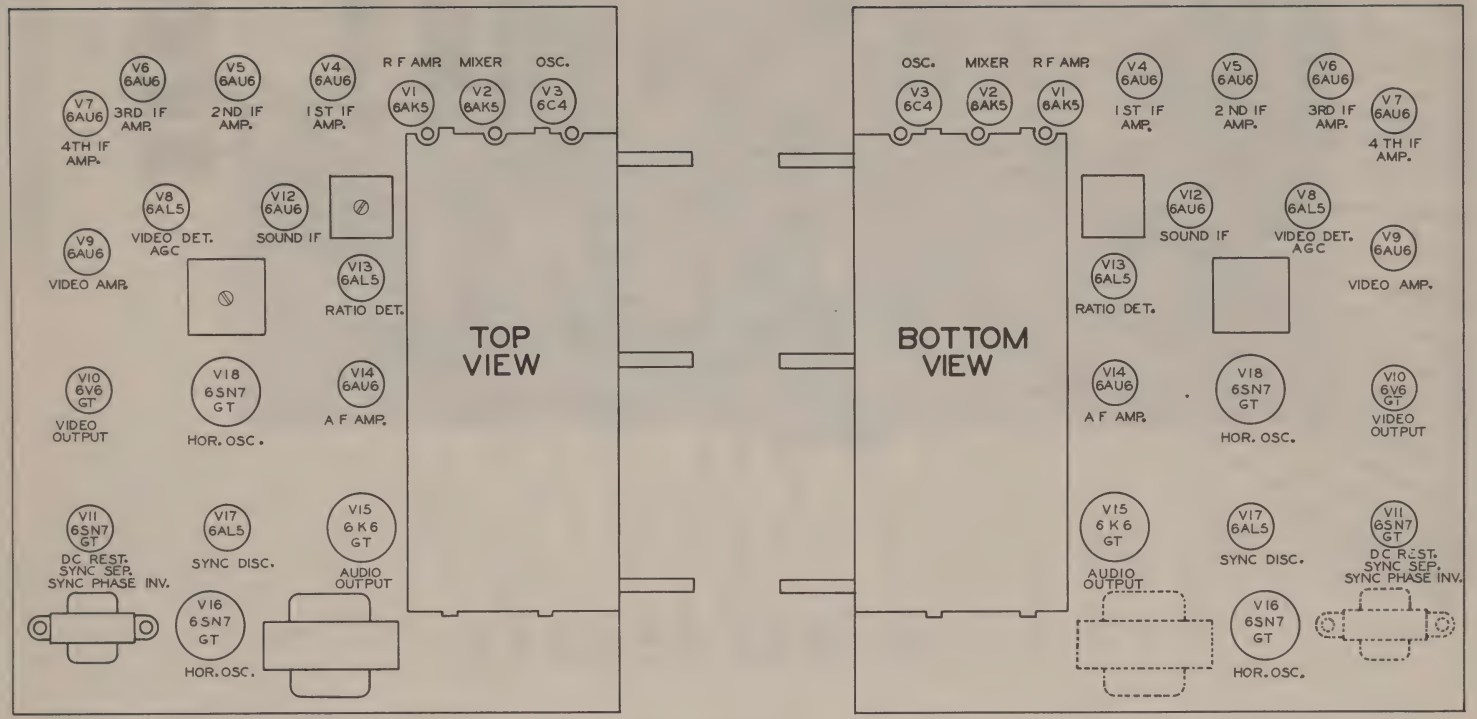
| ITEM No. | USE | DC RES. PRI. | DC RES. SEC. | REPLACEMENT DATA HALLICRAFT. PART No. | REPLACEMENT DATA MEISSNER PART No. | NOTES |
|---|---|---|---|---|---|---|
| L1 | Ant. Input | 0Ω | | 51A1039 | | |
| L2 | RF Plate | 0Ω | | 51A1048 | | Wound on 1 Watt,3.3KΩ resistor |
| L3 | RF Plate | 0Ω | | 51A1051 | | Wound on 1 Watt,2.2KΩ resistor |
| L4 | RF Plate | 0Ω | | 51A1050 | | Wound on 1 Watt,3.3KΩ resistor |
| L5 | RF Plate | 0Ω | | 51A1049 | | Wound on 1/2 Watt,1 Meg resistor |
| L6 | RF Choke | 2Ω | | 53B008 | | |
| L7 | Mixer Grid | 0Ω | | 51A1048 | | Wound on 1 Watt,3.3KΩ resistor |
| L8 | Mixer Grid | 0Ω | | 51A1047 | | Wound on 1 Watt,2.2KΩ resistor |
| L9 | Mixer Grid | 0Ω | | 51A1046 | | Wound on 1 Watt,3.3KΩ resistor |
| L10 | Mixer Grid | 0Ω | | 51A1041 | | Wound on 1/2 Watt,1 Meg resistor |
| L11 | Osc. Coil | 0Ω | | 51A1044 | | Wound on 1 Watt,1 Meg resistor |
| L12 | Osc. Coil | 0Ω | | 51A1043 | | Wound on 1 Watt,1 Meg resistor |
| L13 | Osc. Coil | 0Ω | | 51A1042 | | Wound on 1 Watt,1 Meg resistor |
| L14 | Osc. Coil | 0Ω | | 51A1041 | | Wound on 1/2 Watt,1 Meg resistor |
| L15 | RF Choke | 2Ω | | 53B008 | | |
| L16 | Fil. Choke | .1Ω | .1Ω | 53A133 | | |
| L17 | Fil. Choke | .2Ω | | 53A009 | | |
| L18 | 1st IF | .1Ω | | 50A372-1 | | |
| L19 | 2nd IF | .1Ω | | 50A372-1 | | |
| L20 | 3rd IF | .1Ω | | 50A372-1 | | |
| L21 | 4th IF | .1Ω | | 50A372-1 | | |
| L22 | Video Det. | .1Ω | | 50A372-1 | | |
| L23 | Peaking | 9Ω | | 51A1079 | | Wound on 39KΩ resistor |
| L24 | Peaking | 12Ω | | 51A1080 | | Wound on 1 Meg resistor |
| L25 | Peaking | 7Ω | | 51A1087 | | |
| L26 | Peaking | 6Ω | | 51A1082 | | Wound on 1 Meg resistor |
| L27 | Peaking | 7Ω | | 51A1086 | | |
| L28 | Peaking | 6Ω | | 51A1082 | | Wound on 1 Meg resistor |
| L29 | Sound Trap | 4.5Ω | | 51B1037 | | |
| L30 | Ratio Det. | 4.5Ω | .1Ω | 50B406 | | |
| L31 | Width Control | .5Ω | | 51B1072 | | |
| L32 | Horiz. Linearity Control | 34Ω | | 51B1071 | | |

## MISCELLANEOUS

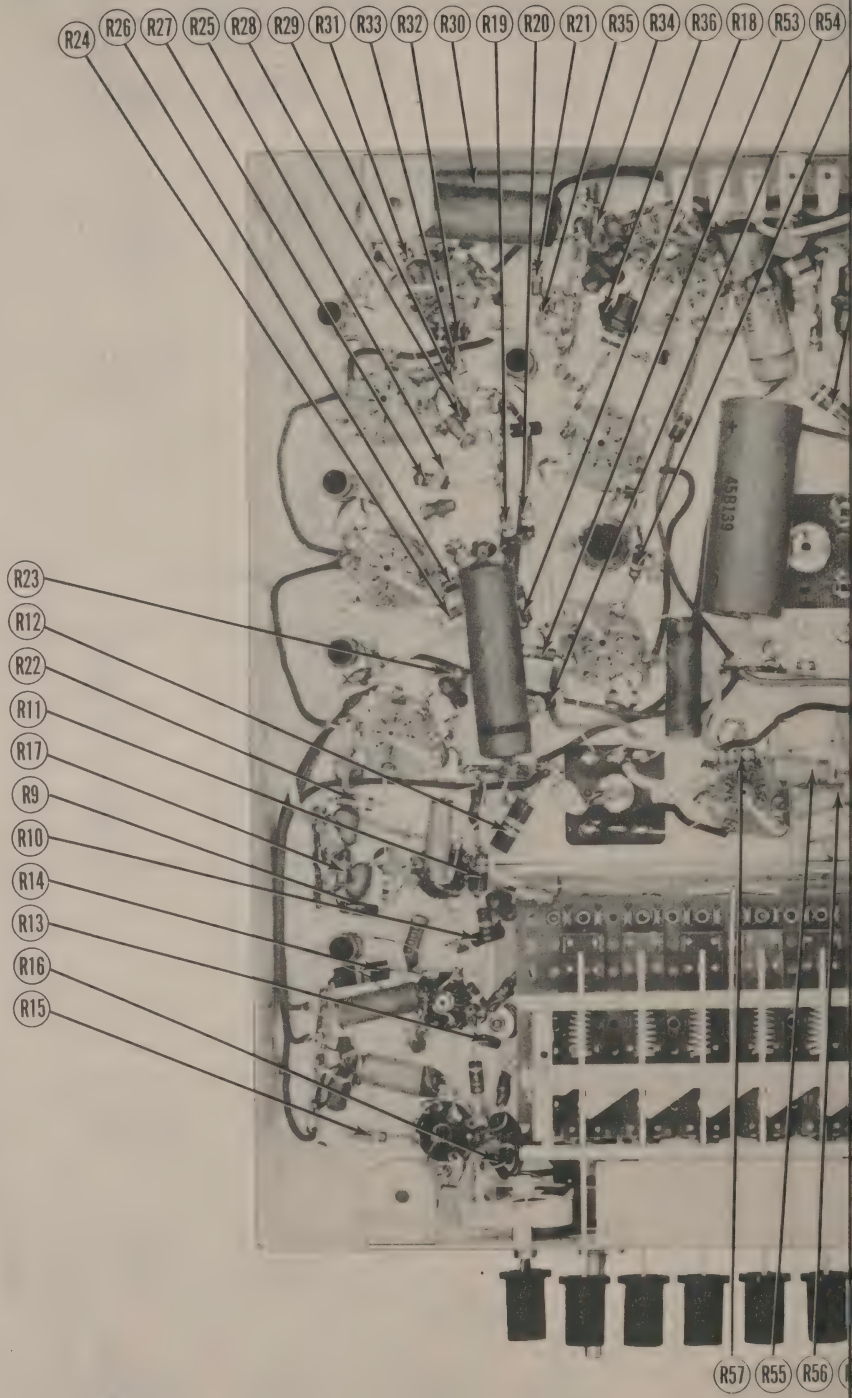
| ITEM No. | PART NAME | HALLICRAFTERS PART No. | NOTES |
|---|---|---|---|
| M1 | Channel Selector Assy | 41X12301 | |
| M2 | Fuse | 39A334 | Type 3AG-1/4 Amp. |
| M3 | Socket | 6A312 | 6 Pin (Power) |
| M4 | Socket | 6A313 | 9 Pin (Power) |
| M5 | Socket | 10A303 | 5 Pin (Speaker) |
| M6 | Socket | 6A270-4 | 4 Pin (Power) |
| M7 | Plug | 10A236-1 | 4 Prong (Power) |
| M8 | Plug | 10A239-1 | 8 Prong, Focus and Deflection Coils |
| M9 | Socket | 10A290-1 | 8 Pin, Focus and Deflection Coils |
| M10 | HV XFMR Assy. | 52A177 | Sealed unit, contains three HV rectifier tubes, and three filter condensers. |
| | Socket | 86B072 | Projection Tube |
| | Mirror | 22C217 | Used on model T60 only |
| | Mirror | 22C221 | Used on model T68 only |
| | Knob | 15B147 | Vert. and Volume control (Front section) |
| | Knob | 15B146 | Horiz. and Brightness control (Rear section) |
| | Knob | 15B148 | Contrast control |
| | Knob | 17A041-2 | Pushbutton and fine tuning |
| | Projection unit | 1X749 | Mounting and alignment assy. contains focus coil and deflection etc. |
| | Projection unit | 1X750 | Optical assy. contains concave mirror, 45 degree mirror, and corrector lens. |
| | Projection unit | 87A1677 | HV cable assy, includes resistor R67, second Anode connector, etc. |



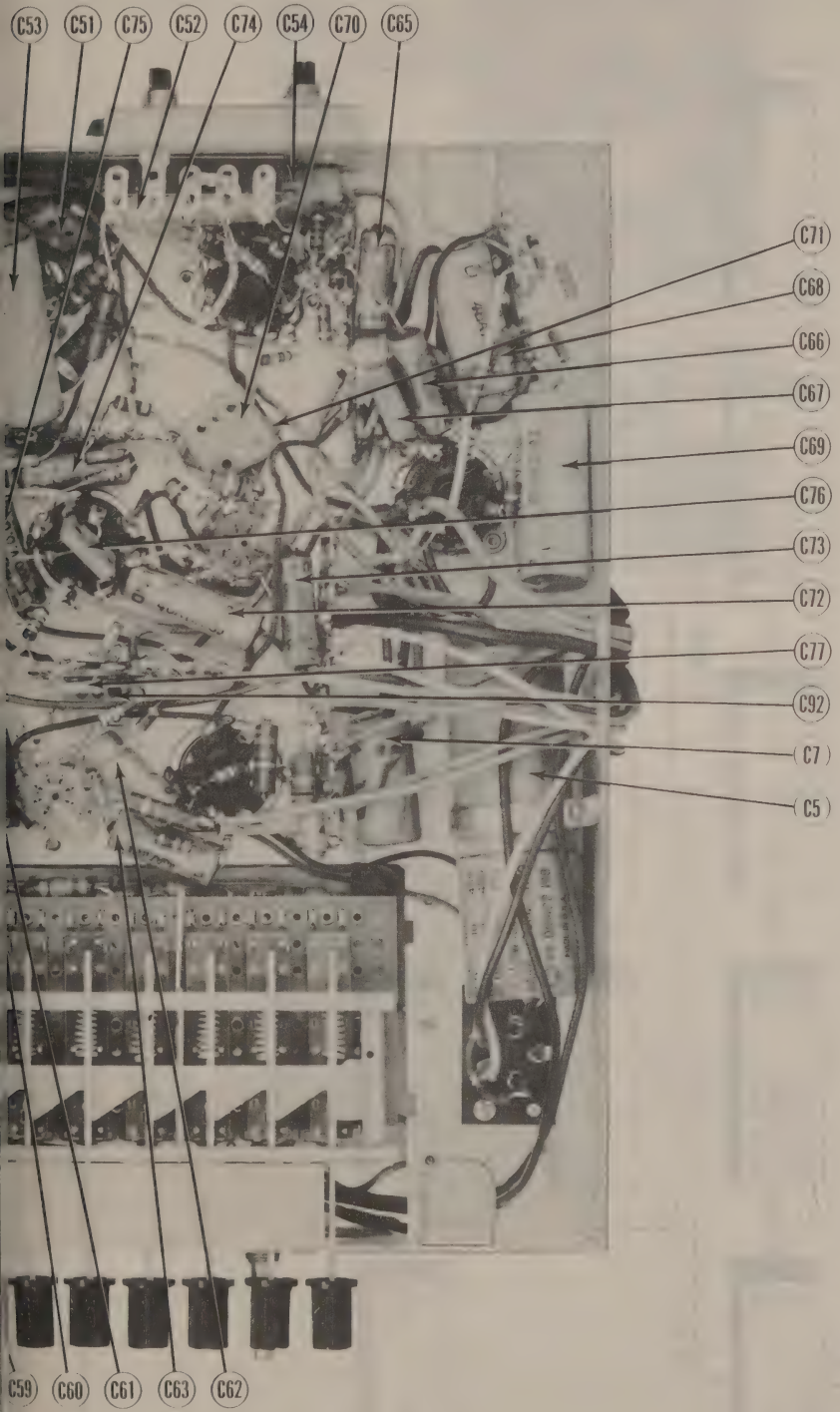

TUBE PLACEMENT CHART



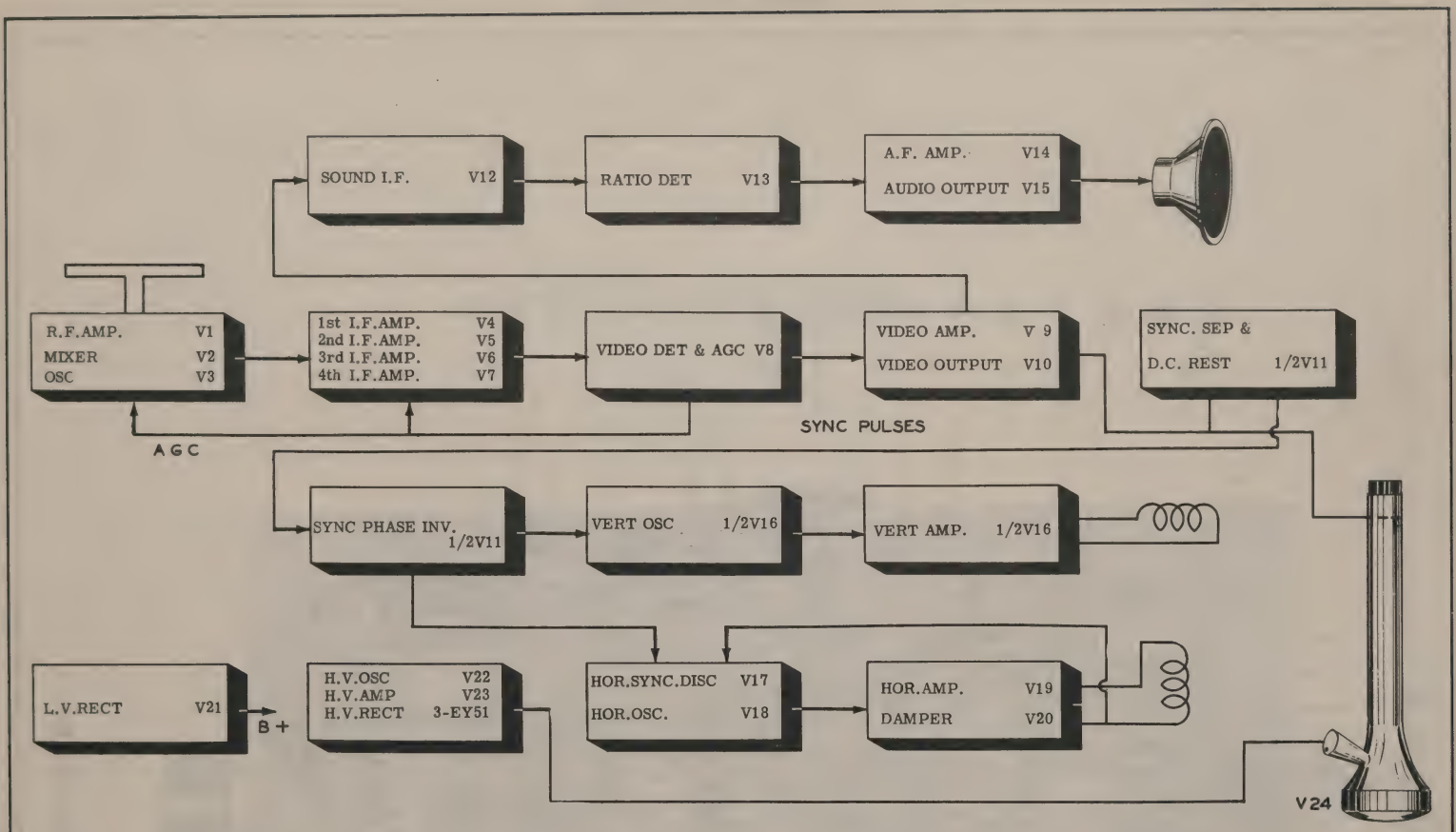

TUBE PLACEMENT CHART



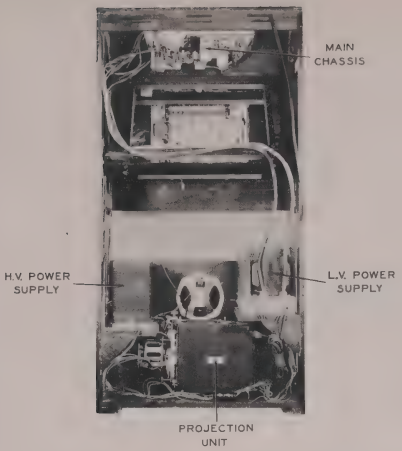

CHASSIS BOTTOM VIEW




'ACITOR IDENTIFICATION




BLOCK DIAGRAM




MOUNTING RACK—REAR VIEW

## DISASSEMBLY INSTRUCTIONS

1. Remove five push-on type control knobs.
2. Remove two plugs from tuner chassis from power supply.
3. Remove tube socket from projection tube.
4. Disconnect deflection and focus coil plugs.
5. Remove three screws holding projection unit.
6. Remove four screws holding HV power supply. Remove complete projection system.
7. Remove four screws holding power supply. Remove power supply.
8. Remove four screws holding tuner chassis. Remove chassis.
9. Remove four 11/32" hex.nuts holding speaker. Remove speaker.

PHOTOFACT* Folder

# HOFFMAN MODELS
## CT-800, CT-801, CT-900, CT-901

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HOFFMAN MODELS
CT-800, CT-801, CT-900, CT-901

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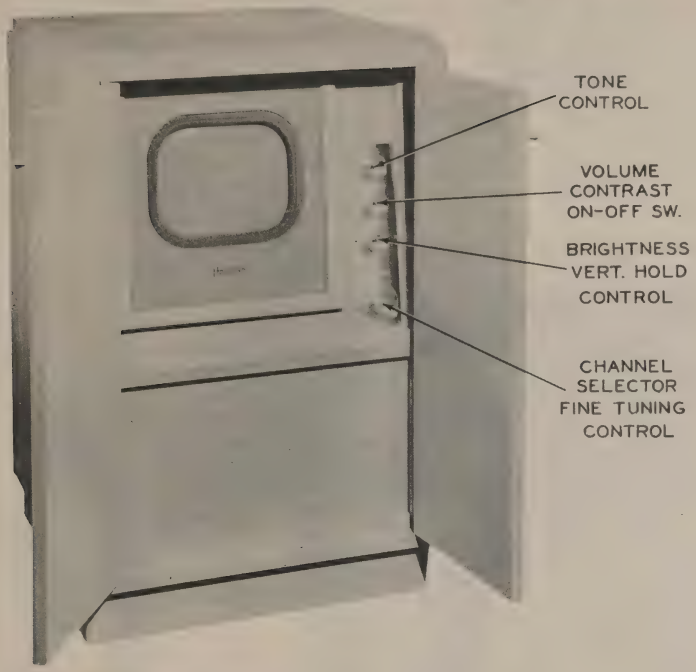
# CT-800 CT-801, CT-900, CT-901




MODEL CT-800

**TRADE NAME** Hoffman Models, CT-800, CT-801, CT-900, CT-901
**MANUFACTURER** Hoffman Radio Corp., 3761 So. Hill St., Los Angeles, California
**TYPE SET** Television Receiver
**TUBES** Thirty

**POWER SUPPLY** 105-125 Volts, 60 Cycles AC RATING 2.6 Amps. @ 117 Volts
**TUNING RANGE**—Channels 2 through 13

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HOFFMAN MODELS
CT-800 CT-801, CT-900, CT-901

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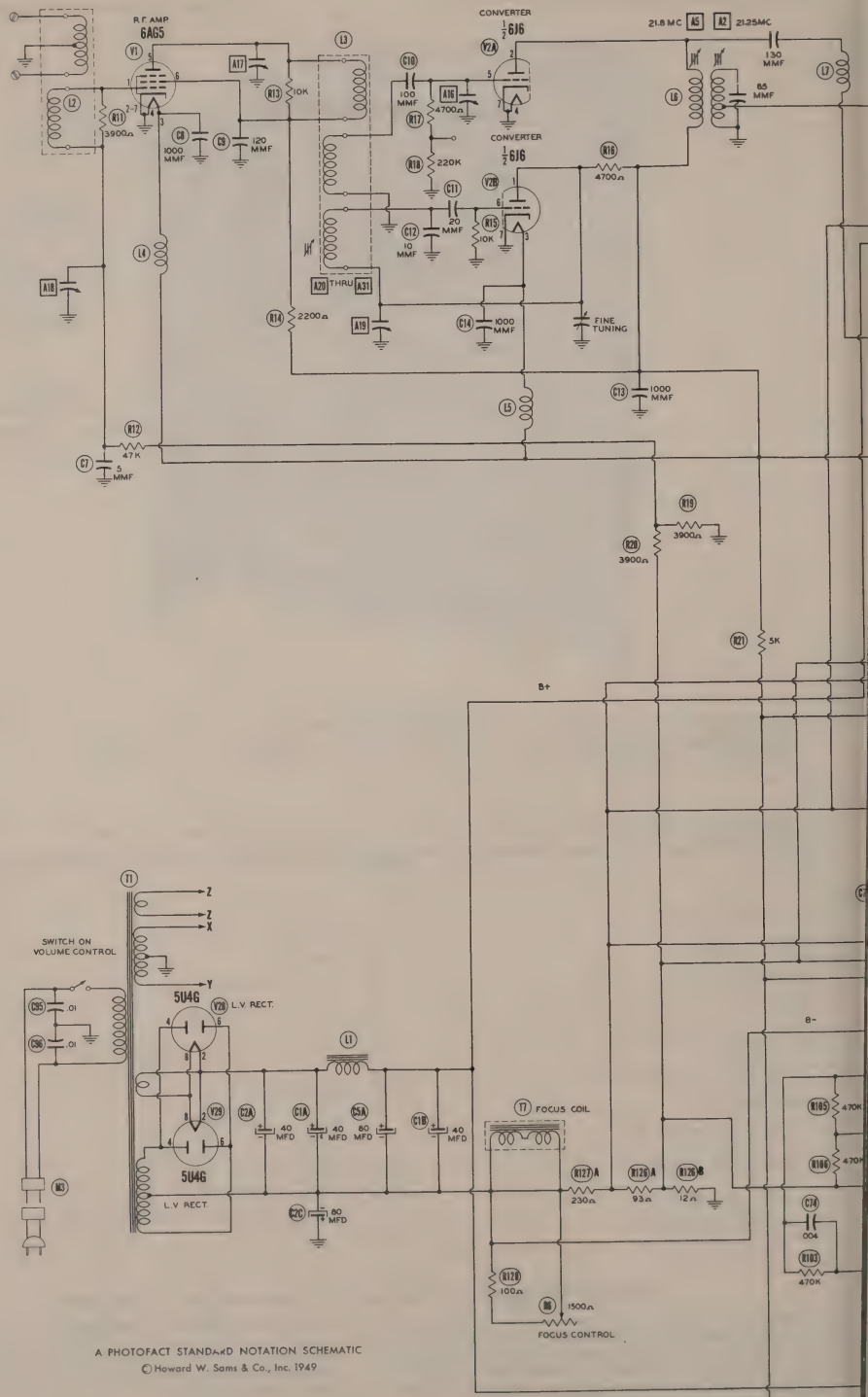
DATE 6/49 4911-11 SET #63 FOLDER 11


R.F. AMP
6AG5
CONVERTER
1/2 6J6
CONVERTER
1/2 6J6
21.8 MC
21.25MC
130 MMF
85 MMF
100 MMF
4700Ω
220K
4700Ω
20 MMF
10 MMF
10K
2200Ω
1000 MMF
FINE TUNING
1000 MMF
47K
5 MMF
3900Ω
3900Ω
5K
B+
B-
SWITCH ON VOLUME CONTROL
.01
.01
5U4G
L.V. RECT.
5U4G
L.V. RECT.
40 MFD
40 MFD
60 MFD
40 MFD
80 MFD
FOCUS COIL
230Ω
93Ω
12Ω
100Ω
1500Ω
FOCUS CONTROL
470K
470K
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470K
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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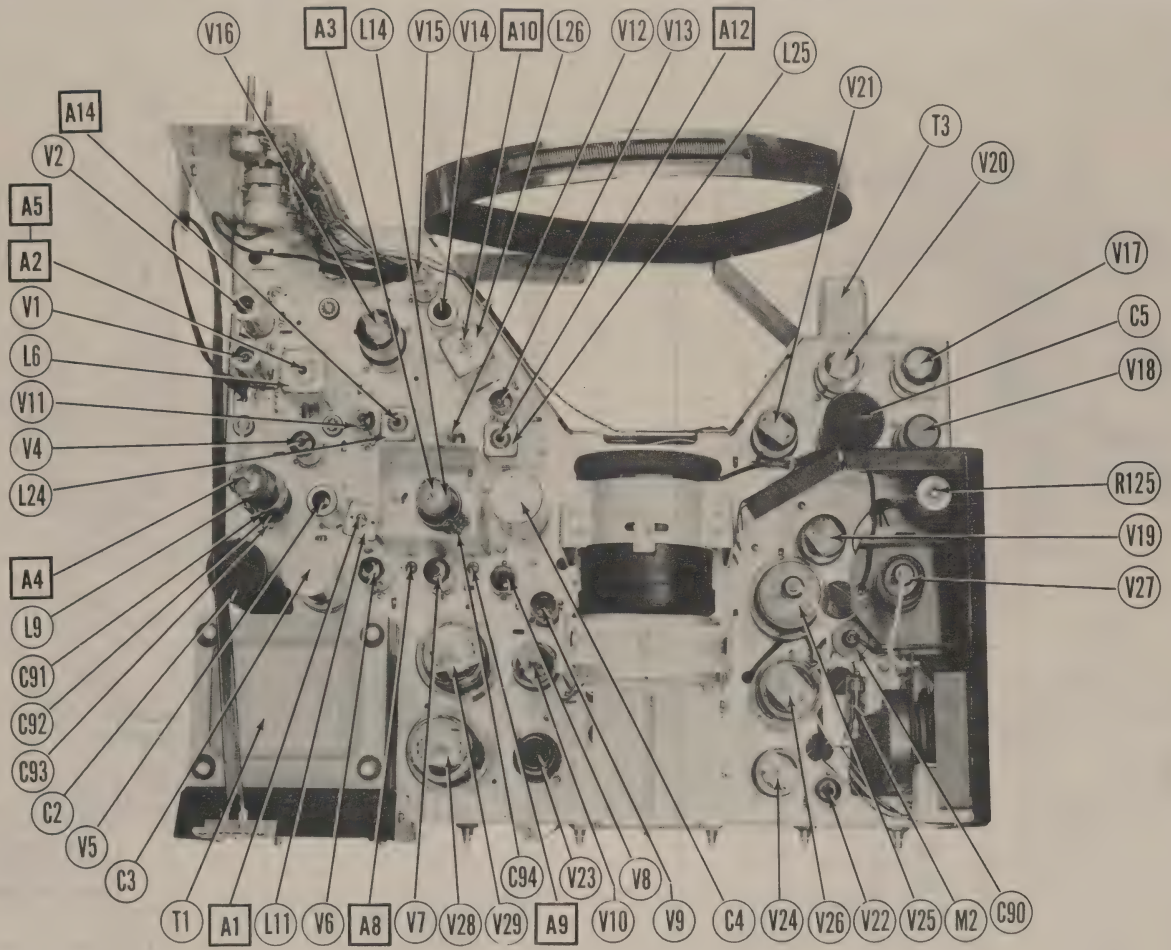
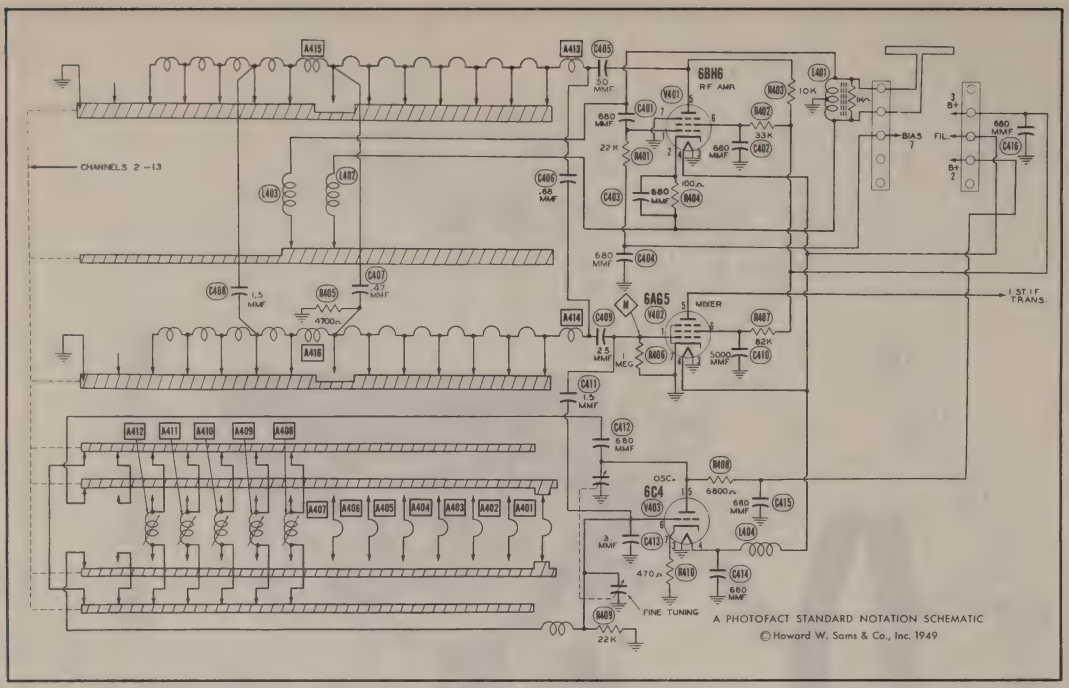



CHASSIS TOP VIEW




# PARTS LIST AND DESCRIPTIONS

## TUBES

| ITEM No. | USE | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | |
|---|---|---|---|---|
| V401 | RF Amp. | 6BH6 | 7CM | |
| V402 | Mixer | 6AG5 | 7BD | |
| V403 | Oscillator | 6C4 | 6BG | |

## RESISTORS

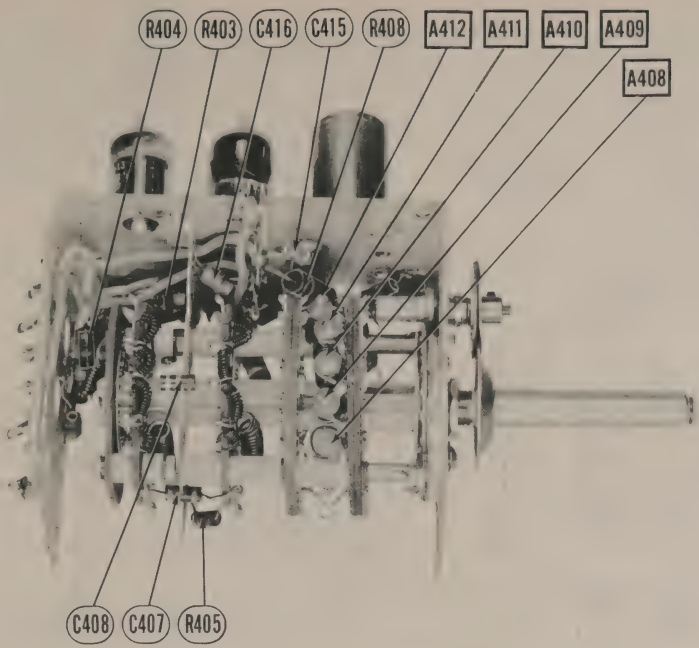
| ITEM No. | RATING: RESISTANCE | RATING: WATTS | IDENTIFICATION |
|---|---|---|---|
| R401 | 22KΩ | ½ | RF Grid |
| R402 | 33KΩ | ½ | RF Screen |
| R403 | 10KΩ | 1 | RF Plate |
| R404 | 100Ω | ½ | RF Cathode |
| R405 | 4700Ω | ½ | Mixer Coil Shunt |
| R406 | 1 Meg. | ½ | Mixer Grid |
| R407 | 82KΩ | ½ | Mixer Screen |
| R408 | 6800Ω | 1 | Osc. Plate |
| R409 | 22KΩ | ½ | Osc. Grid |
| R410 | 470Ω | ½ | Osc. Cathode |

## CAPACITORS

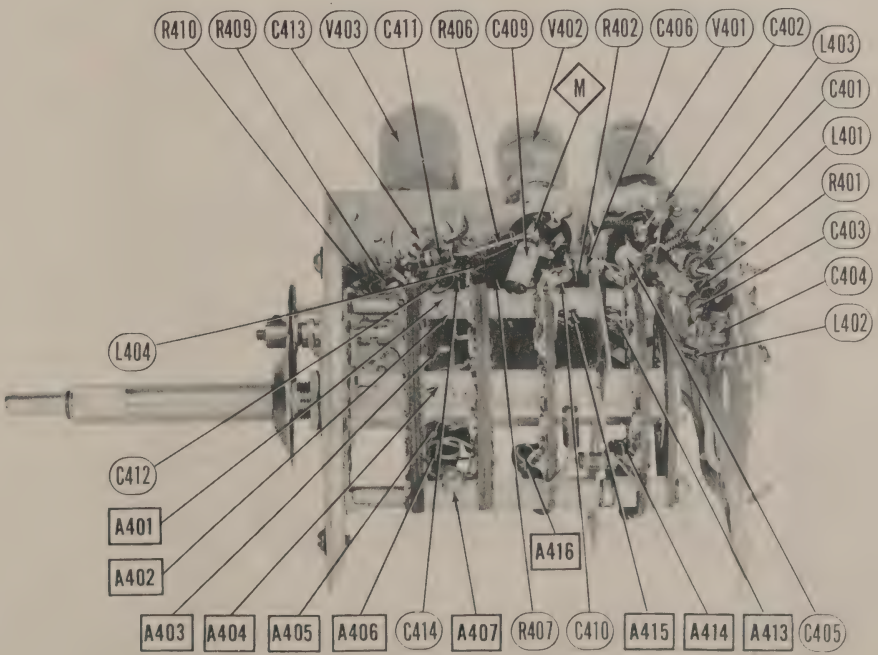
| ITEM No. | RATING: CAP. | RATING: VOLT | IDENTIFICATION |
|---|---|---|---|
| C401 | 680 | | RF Coupling |
| C402 | 680 | | RF Screen Bypass |
| C403 | 680 | | RF Cathode Bypass |
| C404 | 680 | | Bias Filter |
| C405 | 50 | | RF Coupling |
| C406 | .68 | | RF Coupling |
| C407 | .47 | | RF Coupling |
| C408 | 1.5 | | RF Coupling |
| C409 | 2.5 | | RF Coupling |
| C410 | 5000 | | Mixer Screen Bypass |
| C411 | 1.5 | | Osc. Coupling |
| C412 | 680 | | Osc. Feedback |
| C413 | 3 | | Osc. Feedback |
| C414 | 680 | | Filament Bypass |
| C415 | 680 | | RF Bypass |
| C416 | 680 | | RF Bypass |

## COILS

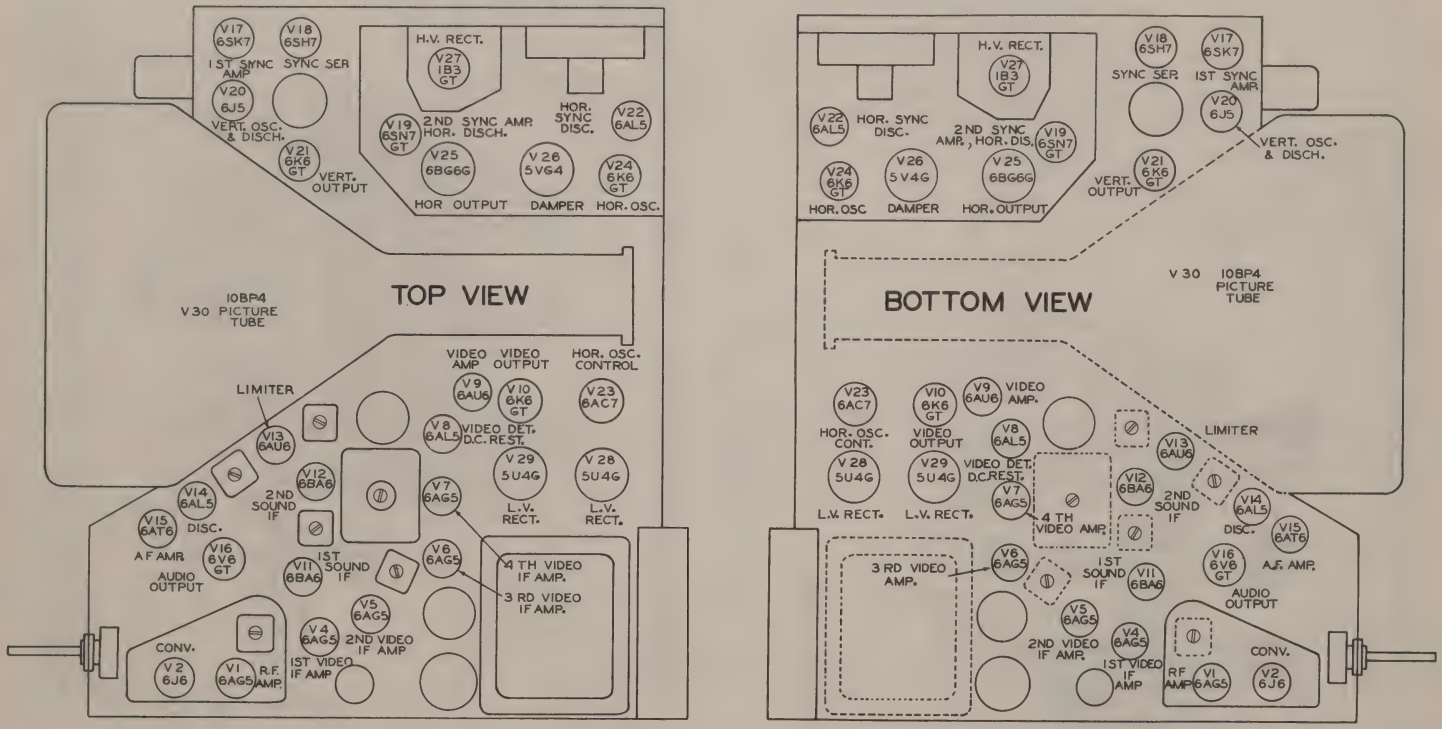
| ITEM No. | USE | DC RES.: PRI. | DC RES.: SEC. | |
|---|---|---|---|---|
| L401 | Ant. Input | 0Ω | | Wound on powdered iron core & 1000Ω resistor |
| L402 | Ant. Input High Band | 0Ω | | |
| L403 | Ant. Input High Band | 0Ω | | |
| L404 | Fil. Choke | 0Ω | | |



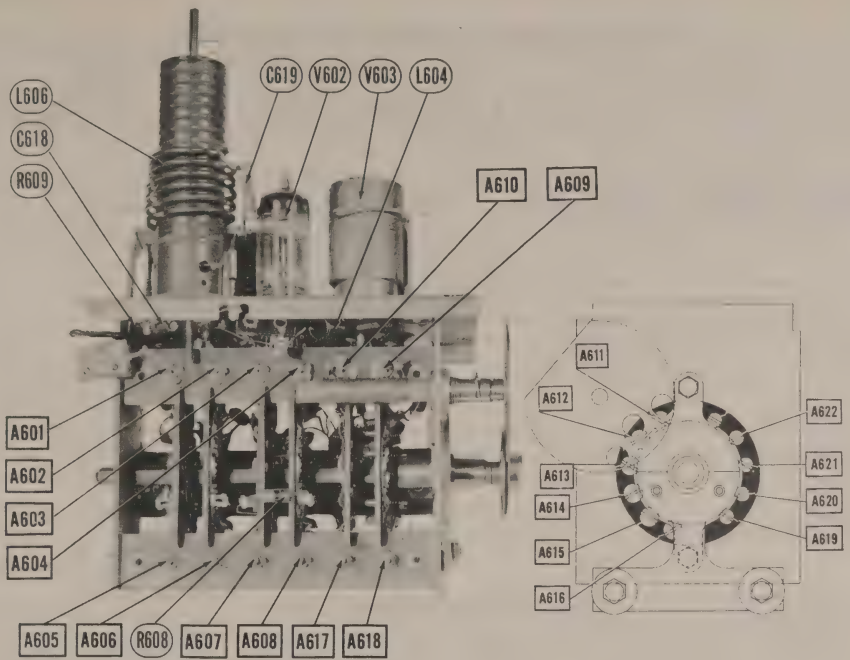

RF TUNER-LEFT SIDE



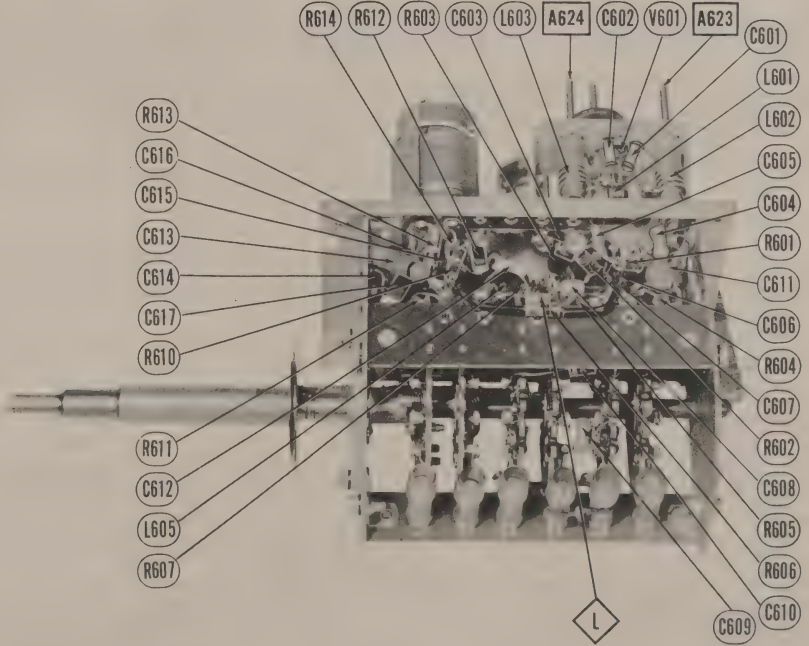

RF TUNER-RIGHT SIDE




TUBE PLACEMENT CHART




RF TUNER-LEFT SIDE




RF TUNER-RIGHT SIDE

**PRE-ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT**

If alignment is performed with picture tube removed, remove V24 from its socket to disable the high voltage supply.

The oscillator tube (V3) should be removed when performing IF Adjustments. Use insulated alignment screwdriver for adjusting.

**VIDEO IF ALIGNMENT**

If receiver is badly misaligned making it impossible to get sufficent reading on VTVM with the signal being fed to the antenna terminals, signal may be fed to the mixer grid. This point is accessible in the different tuners as follows. STANDARD COILS Point J
RCA Point L
SARKES TARZIAN Loop a few turns of wire around the mixer tube.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1 | | | | 9 | DC Probe to junctions of R4C and R41. Common to chassis. | | Set contrast control to give a -3 volt reading. Leave at this setting during entire IF Alignment procedure. |
| 2 | Direct | To ant. terminals. (See prealignment notes) | 19.75MC | 9 | DC Probe to point (A) Common to chassis. | A1 | Adjust for minimum deflection. |
| 3 | Direct | " | 21.25MC | 9 | " | A2 | " " " " |
| 4 | Direct | " | 21.25MC | 9 | " | A3 | " " " " |
| 5 | Direct | " | 27.25MC | 9 | " | A4 | Adjust for minimum deflection. Those models having 3 fixed trimmers across this trap winding should be adjusted for minimum at 21.25MC. |
| 6 | Direct | " | 21.8MC | 9 | " | A5 | Adjust for maximum deflection |
| 7 | Direct | " | 25.3MC | 9 | " | A6 | " " " " |
| 8 | Direct | " | 22.3MC | 9 | " | A7 | " " " " |
| 9 | Direct | " | 25.2MC | 9 | " | A8 | " " " " |
| 10 | Direct | " | 23.4MC | 9 | " | A9 | Adjust for maximum deflection. If A7 required adjustment in Step 8 repeat Step 2. If FM signal generator is not avaiable continue with Step 12. |

**OVERALL VIDEO IF ALIGNMENT**

Connect the synchronized sweep voltage from the signal generator to the horizontal amplifier in the scope for horizontal deflection.

The insertion of the sweep generator signal will vary with the type tuner used. Determine which tuner is being used and inject the signal as follows: STANDARD COIL TUNER: Remove the oscillator mixer coil strip for any channel and turn the channel selector switch to that channel. Connect the high side of the generator to point J and the low side to chassis. RCA TUNER: Remove the RF Amp. mixer and oscillator tubes and use the dummy mixer tube as shown in figure 6. SARKES TARZIAN: Remove the oscillator, RF Amp., and mixer tubes and use dummy mixer tube as shown in Fig. 7.

The waveforms shown may be inverted depending on the number of amplifying stages in the vertical amplifier in the scope being used.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 11 | 5000MMF | See instructions above | 24MC (10MC Sweep) | See Fig. 4. | 9 | Vert. Amp. to Point (A) Ground to chassis. | A5,A6, A7,A8 A9 | Make slight adjustments necessary to obtain response curve per Fig.4 If considerable adjustment is required the traps must be realigned. |

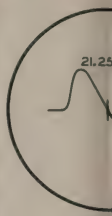
**SOUND IF ALIGNMENT USING VTVM**

Do not remove the shield covering the discriminator tube socket during step 12. Fashion hook on 1 Megohm resistor and make connection to Point B through alignment hole in shield.

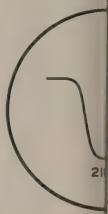
| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 12 | 5000MMF | High side to pin #1 of 3rd Sound IF (V13). Low side to chassis. | 21.25MC | 9 | DC Probe to Point (B) in series with 1 Meg. Common to chassis. | A10 | Detune A11. Adjust A10 for maximum deflection. |
| 13 | 5000MMF | " | " | 9 | DC Probe to point (C) Common to chassis. | A11 | Adjust for zero reading. A positive or negative reading is obtained on either side of correct setting. |
| 14 | 5000MMF | High side to pin #1 of 2nd Sound IF (V12). Low side to chassis. | " | 9 | DC Probe to point (D) Common to chassis. | A12,A13 | Adjust for maximum deflection. |
| 15 | 5000MMF | High side to pin #1 (Grid) of 6BA6 (V1) Low side to chassis. | " | 9 | " | A14,A15 | " " " " |

**SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE**

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 12 | 5000MMF | High side to pin #1 of 3rd Sound IF (V13). Low side to chassis. | 21.25MC (600KC Sweep) | 21.25MC | 9 | Vertical amp. to Point (C) Ground to chassis. | A10,A11 | Adjust for maximum aplitude of peaks and straightness of diagonal line with marker at center of line as per Fig. 1. |
| 13 | 5000MMF | High side to pin #1 of 2nd Sound IF (V12). Low side to chassis. | " | " | 9 | Vert. Amp. to point (D) in series with 33KΩ. Ground to chassis | A12,A13 | Adjust for maximum amplitude and symmetry per Fig. 2. |
| 14 | 5000MMF | High side to pin #1 (Grid) of 6BA6 (V11). Low side to chassis. | " | " | 9 | " | A14,A15 | Adjust for maximum amplitude and symmetry per Fig. 3. Continue with Step 16. |



FIG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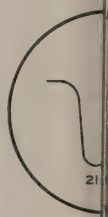
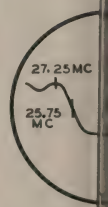


FIG



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## RF AMP & MIXER ALIGNMENT (STANDARD COIL TUNER)

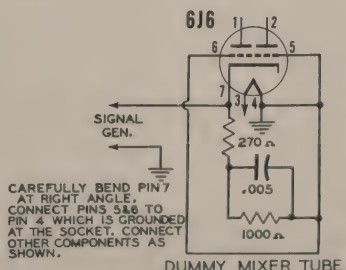
Set contrast control to -1.5 volts. Measure from arm of control to chassis.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 16 | Direct | Across antenna terminals. | 207MC (10MC Sweep) | 205.25MC 209.75MC | 12 | Vertical amp. through 10KΩ to point ◇ Low side to chassis. | A16, A17, A18 | Adjust for flat top pattern with markers appearing as per Fig. 5. |
| 17 | Direct | " | 213MC (10MC Sweep) | 211.25MC* 215.75MC† | 13 | | | Check marker for all channels. If maximum reception is desired for one specific channel, adjust A16, A17 & A18 on that channel and then check all other channels to make certain that they have not been appreciably affected. |
| | | | 201MC (10MC Sweep) | 199.25MC* 203.75MC† | 11 | | | |
| | | | 195MC (10MC Sweep) | 193.25MC* 197.75MC† | 10 | | | |
| | | | 189MC (10MC Sweep) | 187.25MC* 191.75MC† | 9 | | | |
| | | | 183MC (10MC Sweep) | 181.25MC* 185.75MC† | 8 | | | |
| | | | 177MC (10MC Sweep) | 175.25MC* 179.75MC† | 7 | | | |
| | | * Picture carrier † Sound carrier | 85MC (10MC Sweep) | 83.25MC* 87.75MC† | 6 | | | |
| | | | 79MC (10MC Sweep) | 77.25MC* 81.75MC† | 5 | | | |
| | | | 69MC (10MC Sweep) | 67.25MC* 71.75MC† | 4 | | | |
| | | | 63MC (10MC Sweep) | 61.25MC* 65.75MC† | 3 | | | |
| | | | 57MC (10MC Sweep) | 55.25MC* 59.75MC† | 2 | | | |

## OSCILLATOR ALIGNMENT (STANDARD COIL TUNER)

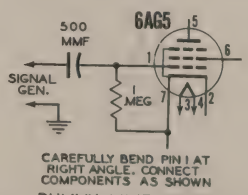
Complete alignment of the oscillator circuit may not be necessary. This is determined by checking to see that a zero reading is obtained for each channel when the fine tuning control is turned through the midpoint of its range. (Connect signal generator and VTVM as in steps 18 & 19. Sound carrier frequencies are listed in Step 19.) If the majority of the channels seem to need oscillator alignment this sometimes may be done in one operation-Step 18, by adjusting A19. It should be noted that this is an all channel adjustment and should not be adjusted for individual channels. If step 18 fails to align the oscillator circuit sufficiently, it will be necessary to adjust the oscillator coil slugs. These are accessible one channel at a time. Turn the fine tuning control to its extreme counter-clockwise position which automatically centers this control. Note that the oscillator slugs are now available one by one, as the channel switch is rotated, through the small hole in the front panel of the tuner sub-chassis. Follow Step 19 for alignment frequencies.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 18 | Direct | High side to one ant. terminal. Low side to chassis. | 215.75MC | 13 | DC Probe to Point ◇ Common lead to chassis. | A19 | Adjust for zero reading between positive and negative peaks with fine tuning control at midpoint. Rotate channel switch and adjust oscillator slugs for individual channels. Then repeat Step 18. |
| 19 | Direct | " | 215.75MC | 13 | " | A20 | |
| | | | 209.75MC | 12 | " | A21 | |
| | | | 203.75MC | 11 | " | A22 | |
| | | | 197.75MC | 10 | " | A23 | |
| | | | 191.75MC | 9 | " | A24 | |
| | | | 185.75MC | 8 | " | A25 | |
| | | | 179.75MC | 7 | " | A26 | |
| | | | 87.75MC | 6 | " | A27 | |
| | | | 81.75MC | 5 | " | A28 | |
| | | | 71.75MC | 4 | " | A29 | |
| | | | 65.75MC | 3 | " | A30 | |
| | | | 59.75MC | 2 | " | A31 | |


6J6
SIGNAL GEN.
270Ω
.005
1000Ω
CAREFULLY BEND PIN 7 AT RIGHT ANGLE. CONNECT PINS 5&6 TO PIN 4 WHICH IS GROUNDED AT THE SOCKET. CONNECT OTHER COMPONENTS AS SHOWN.

DUMMY MIXER TUBE

FIG. 6




DUMMY MIXER TUBE

FIG. 7

# ALIGNMENT INSTRUCTIONS (CONT.)

## OSCILLATOR ALIGNMENT (SARKES TARZIAN TUNER)

The RF Amplifier and mixer lines of this tuner are very stable and normally should never require adjustment. Set tuning control at center of its range during alignment of the oscillator circuit. The osc. adjustments are independent of each other and only those channels out of alignment need be adjusted.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 16 | Two 150Ω carbon res. | Insert 150Ω resistor in series with each generator lead and connect across the antenna terminals. | 215.75MC (no mod.) | 13 | DC Probe to Point ⓑ Low side to chassis. | A401 | Expand or compress coil for maximum deflection. Signal generator must be set very accurately. |
| 17 | Two 150Ω carbon res. | " | 209.75MC | 12 | " | A402 | " |
| | | | 203.75MC | 11 | | A403 | |
| | | | 197.75MC | 10 | | A404 | |
| | | | 191.75MC | 9 | | A405 | |
| | | | 185.75MC | 8 | | A406 | |
| | | | 179.75MC | 7 | | A407 | |
| 18 | Two 150Ω carbon res. | " | 87.75MC | 6 | " | A408 | Adjust for maximum deflection. |
| 19 | Two 150Ω carbon res. | " | 81.75MC | 5 | " | | " |
| | | | 71.75MC | 4 | | | |
| | | | 65.75MC | 3 | | | |
| | | | 59.75MC | 2 | | | |

## RF AMP & MIXER ALIGNMENT (RCA TUNER)

Set fine tuning to mid-capacity point and contrast control to -1.5 volts reading.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 16 | Direct | Across antenna terminals. | 213MC (10MC Sweep) | 211.25MC* 215.75MC† | 13 | Vertical amp. through 10KΩ to point ⓐ Low side to chassis. | A601, A602, A603, A604 | Adjust for flat top response pattern and markers falling as Per Fig. 5. |
| 17 | Direct | " | 207MC | 205.25MC* 209.75MC† | 12 | " | | Check response pattern as per Fig. 5. |
| | | | 201MC | 199.25MC* 203.75MC† | 11 | " | | " |
| | | | 195MC | 193.25MC* 197.75MC† | 10 | " | | |
| | | | 189MC | 187.25MC* 191.75MC† | 9 | " | | |
| | | | 183MC | 181.25MC* 185.75MC† | 8 | " | | |
| | | | 177MC | 175.25MC* 179.75MC† | 7 | " | | |
| | | | 85MC (10MC Sweep) | 83.25MC* 87.75MC† | 6 | " | A605, A606, A607, A608 | Adjust for flat top response pattern with markers appearing as per Fig. 5. |
| | | | 79MC | 77.25MC* 81.75MC† | 5 | " | | Check response pattern as per Fig. 5. |
| | | | 69MC | 67.25MC* 71.75MC† | 4 | " | | " |
| | | | 63MC | 61.25MC* 65.75MC† | 3 | " | | " |
| | | * Picture carrier † Sound carrier | 57MC | 55.25MC* 59.75MC† | 2 | " | | " |

## OSCILLATOR ALIGNMENT (RCA TUNER)

Set fine tuning control to mid-capacity point.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 18 | Direct | High side to one ant. terminals. Low side to chassis. | 215.75MC | 13 | DC Probe to Point ⓐ Low side to chassis. | A609, A610 | Adjust for zero reading between positive and negative peaks. |
| 19 | | | 209.75MC | 12 | " | A611 | " |
| | | | 203.75MC | 11 | | A612 | |
| | | | 197.75MC | 10 | | A613 | |
| | | | 191.75MC | 9 | | A614 | |
| | | | 185.75MC | 8 | | A615 | |
| | | | 179.75MC | 7 | | A616 | |
| | | | 87.75MC | 6 | | A617,618 | |
| | | | 81.75MC | 5 | | A619 | |
| | | | 71.75MC | 4 | | A620 | |
| | | | 65.75MC | 3 | | A621 | |
| | | | 59.75MC | 2 | | A622 | |

Wave traps A623 & A624 are used for specific types of interference and their alignment will depend upon the type encountered.

With the receiver tuned to the channel having the interference, set fine tuning control until interference is at maximum. Adjust A623 & A624 for minimum interference in the picture and sound keeping both cores at approximately the same relative position. Turn one core 1/2 turn and adjust the other for minimum interference.

# VOLTAGE AND RESISTANCE MEASUREMENTS

## VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | TOP CAP |
|---|---|---|---|---|---|---|---|---|---|---|
| V 1A | 6AG5 | -.9VDC | 0V | 6.3VAC | 0V | 135VDC | 135VDC | 0V | | |
| V 2A | 6J6 | 95VDC | 150VDC | 6.3VAC | 0V | -.9VDC | §-3.8VDC | 0V | | |
| V 3 | | | | | | | | | | |
| V 4 | 6AG5 | -5.2VDC | 0V | 0V | 6.3VAC | 138VDC | 138VDC | 0V | | |
| V 5 | 6AG5 | -5.2VDC | 0V | 6.3VAC | 0V | 138VDC | 138VDC | 0V | | |
| V 6 | 6AG5 | -5.4VDC | 0V | 6.3VAC | 0V | 138VDC | 138VDC | 0V | | |
| V 7 | 6AG5 | 0V | 1.2VDC | 6.3VAC | 0V | 100VDC | 130VDC | 1.2VDC | | |
| V 8 | 6AL5 | 0V | -48VDC | 6.3VAC | 0V | -27VDC | 0V | -1VDC | | |
| V 9 | 6AT6 | -.6VDC | 0V | 0V | 6.3VAC | 240VDC | 138VDC | 0V | | |
| V 10 | 6K6GT | 0V | 0V | 100VDC | 138VDC | -2.4VDC | 0V | 6.3VAC | 4.3VDC | |
| V 11 | 6BA6 | 0V | 0V | 0V | 6.3VAC | 140VDC | 120VDC | 1.8VDC | | |
| V 12 | 6BA6 | 0V | 0V | 6.3VAC | 0V | 125VDC | 120VDC | 1.8VDC | | |
| V 13 | 6AU6 | -.3VDC | 0V | 0V | 6.3VAC | 48VDC | 48VDC | 0V | | |
| V 14 | 6AL5 | 0V | -.1VDC | 4.9VAC | 0V | 0V | 0V | -.3VDC | | |
| V 15 | 6AT6 | -.4VDC | 0V | 0V | 6.3VAC | -.5VDC | -.5VDC | 70VDC | | |
| V 16 | 6V6GT | 0V | 6.3VAC | 230VDC | 245VDC | -5.7VDC | -20VDC | 0V | 0V | |
| V 17 | 6SK7 | 0V | 0V | 0V | -.8VDC | 0V | 125VDC | 6.3VAC | 185VDC | |
| V 18 | 6SH7 | 0V | 0V | 0V | -1VDC | 0V | 138VDC | 6.3VAC | 138VDC | |
| V 19 | 6SH7GT | -.4VDC | 88VDC | 0V | -110VDC | -27VDC | -80VDC | 6.3VAC | 0V | |
| V 20 | 6J5 | 0V | 0V | 0V<br>215VDC | -80VDC | -85VDC | -80VDC | 6.3VAC | -80VDC | |
| V 21 | 6K6GT | 0V | 6.3VAC | 220VDC | 220VDC | -55VDC | -55VDC | 0V | -45VDC<br>-55VDC | |
| V 22 | 6AL5 | -.8VDC | -3.6VDC | 0V | 4.9VAC | -1.2VDC | 0V | -7.5VDC | | |
| V 23 | 6AC7 | 0V | 0V | 0V | -1VDC | 0V | 105VDC | 6.3VAC | 240VDC | |
| V 24 | 6K6GT | 0V | 0V | 175VDC | 200VDC | -21VDC<br>-22VDC | 340VDC | 6.3VAC | .2VDC | |
| V 25 | 6BG6G | 0V | 6.3VAC | -70VDC | 0V | -80VDC | 0V | 0V | 155VDC | + |
| V 26 | 5V4G | 0V | 340VDC | .2VDC | 275VDC | 0V | 275VDC | 0V | 340VDC | |
| V 27 | 1B3GT | | | | | | | | | |
| V 28 | 5U4G | 0V | 280VDC | 0V | 350VAC | 0V | 350VAC | 0V | 280VDC | |
| V 29 | 5U4G | 0V | 280VDC | 0V | 350VAC | 0V | 350VAC | 0V | 280VDC | |
| V 30 | 10BP4 | 0V | -45VDC | PIN 10<br>280VDC | PIN 11<br>0V | PIN 12<br>6.3VAC | | | | |

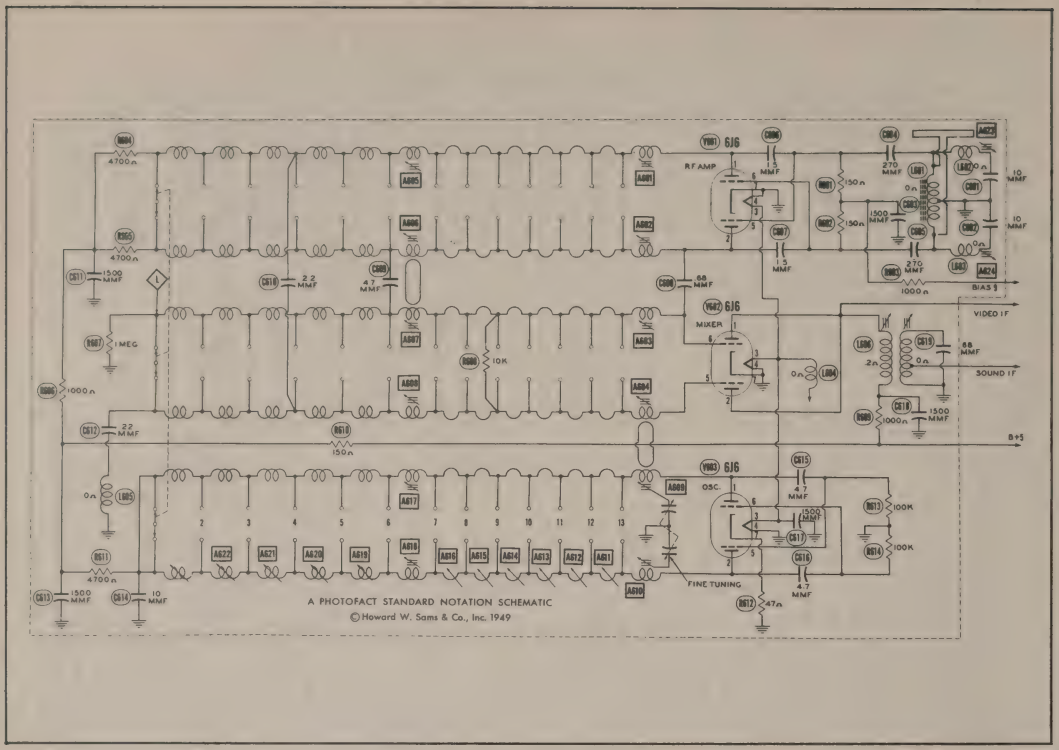
+ Do not measure
§ Taken with vacuum tube voltmeter

## RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | TOP CAP |
|---|---|---|---|---|---|---|---|---|---|---|
| V 1 | 6AG5 | 60KΩ | 0Ω | .2Ω | 0Ω | *7KΩ | *7KΩ | 0Ω | | |
| V 2 | 6J6 | *9.5KΩ | *5KΩ | .2Ω | 0Ω | 250KΩ | 10KΩ | 0Ω | | |
| V 3 | | | | | | | | | | |
| V 4 | 6AG5 | 18KΩ | 39Ω | 0Ω | .2Ω | *2.5KΩ | *2.5KΩ | 39Ω | | |
| V 5 | 6AG5 | 17KΩ | 39Ω | .2Ω | 0Ω | *2.5KΩ | *2.5KΩ | 39Ω | | |
| V 6 | 6AG5 | 11KΩ | 39Ω | .2Ω | 0Ω | *5KΩ | *2.2KΩ | 39Ω | | |
| V 7 | 6AG5 | .5Ω | 150Ω | .2Ω | 0Ω | *6KΩ | *2.2KΩ | 150Ω | | |
| V 8 | 6AL5 | .5Ω | 180KΩ | .2Ω | 0Ω | 1 Meg. | 0Ω | 3.9KΩ | | |
| V 9 | 6AU6 | 470KΩ | 0Ω | 0Ω | .2Ω | *10KΩ | *1200Ω | 0Ω | | |
| V 10 | 6K6GT | 0Ω | 0Ω | *4.5KΩ | *1200Ω | 470KΩ | Inf. | .2Ω | 330Ω | |
| V 11 | 6BA6 | .1Ω | 0Ω | 0Ω | .2Ω | *2.2KΩ | *2.2KΩ | 100Ω | | |
| V 12 | 6BA6 | 470KΩ | 0Ω | .2Ω | 0Ω | *2.2KΩ | *4.5KΩ | 1.0Ω | | |
| V 13 | 6AU6 | 22KΩ | 0Ω | 0Ω | .2Ω | *7.5KΩ | *7.5KΩ | 0Ω | | |
| V 14 | 6AL5 | 200KΩ | 100KΩ | .2Ω | 0Ω | 0Ω | 0Ω | 100KΩ | | |
| V 15 | 6AT6 | 10Meg. | 0Ω | 0Ω | .2Ω | Inf. | Inf. | *820KΩ | | |
| V 16 | 6V6GT | Inf. | .2Ω | *1500Ω | *1000Ω | 300KΩ | 100Ω | 0Ω | 0Ω | |
| V 17 | 6SK7 | 0Ω | 0Ω | 0Ω | 1 Meg. | 0Ω | *2.5KΩ | .2Ω | *10KΩ | |
| V 18 | 6SH7 | 0Ω | 0Ω | 0Ω | 850KΩ | 0Ω | *1500Ω | .2Ω | **Ka | |
| V 19 | 6SN7GT | 1 Meg. | *7KΩ | 0Ω | 250KΩ | *700KΩ | 400Ω | .2Ω | 0Ω | |
| V 20 | 6J5 | 0Ω | 0Ω | *1.5Meg.<br>*280KΩ | 50KΩ | 1.5Meg. | 30KΩ | .2Ω | 400Ω | |
| V 21 | 6K6GT | Inf. | .2Ω | *10KΩ | *10KΩ | 2.2Meg. | 4.7KΩ | 0Ω | 7.5K<br>6K | |
| V 22 | 6AL5 | 900KΩ | 1.4Meg. | 0Ω | .2Ω | 12Ω | 0Ω | 1.4Meg | | |
| V 23 | 6AC7 | 0Ω | 0Ω | 0Ω | 1.2Meg. | 10Ω | *18KΩ | .2Ω | *2.2K | |
| V 24 | 6K6GT | Inf. | 0Ω | *8KΩ | *10KΩ | 75KΩ | 110KΩ | .2Ω | 9.2 | |
| V 25 | 6BG6G | Inf. | .2Ω | 450Ω | Inf. | 450KΩ | Inf. | 0Ω | *10KΩ | *5.5K |
| V 26 | 5V4G | Inf. | *5.5KΩ | 330Ω | *42Ω | Inf. | *42Ω | Inf. | *.. | |
| V 27 | 1B3GT | Inf. | Inf. | Inf. | Inf. | Inf. | Inf. | Inf. | Inf. | |
| V 28 | 5U4G | Inf. | 6KΩ | Inf. | 41Ω | Inf. | 41Ω | Inf. | 6K | |
| V 29 | 5U4G | Inf. | 6KΩ | Inf. | 41Ω | Inf. | 41Ω | Inf. | 6K | |
| V 30 | 10BP4 | 0Ω | 1.3Meg. | PIN 10<br>*150KΩ | PIN 11<br>0Ω | PIN 12<br>.2Ω | | | | |

* Measured from pin 2 of V29

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.




# PARTS LIST AND DESCRIPTIONS

## TUBES

| ITEM No. | USE | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | |
|---|---|---|---|---|
| V601 | R. F. Amp. | 6J6 | 7BF | |
| V602 | Mixer | 6J6 | 7BF | |
| V603 | Oscillator | 6J6 | 7BF | |

## CAPACITORS

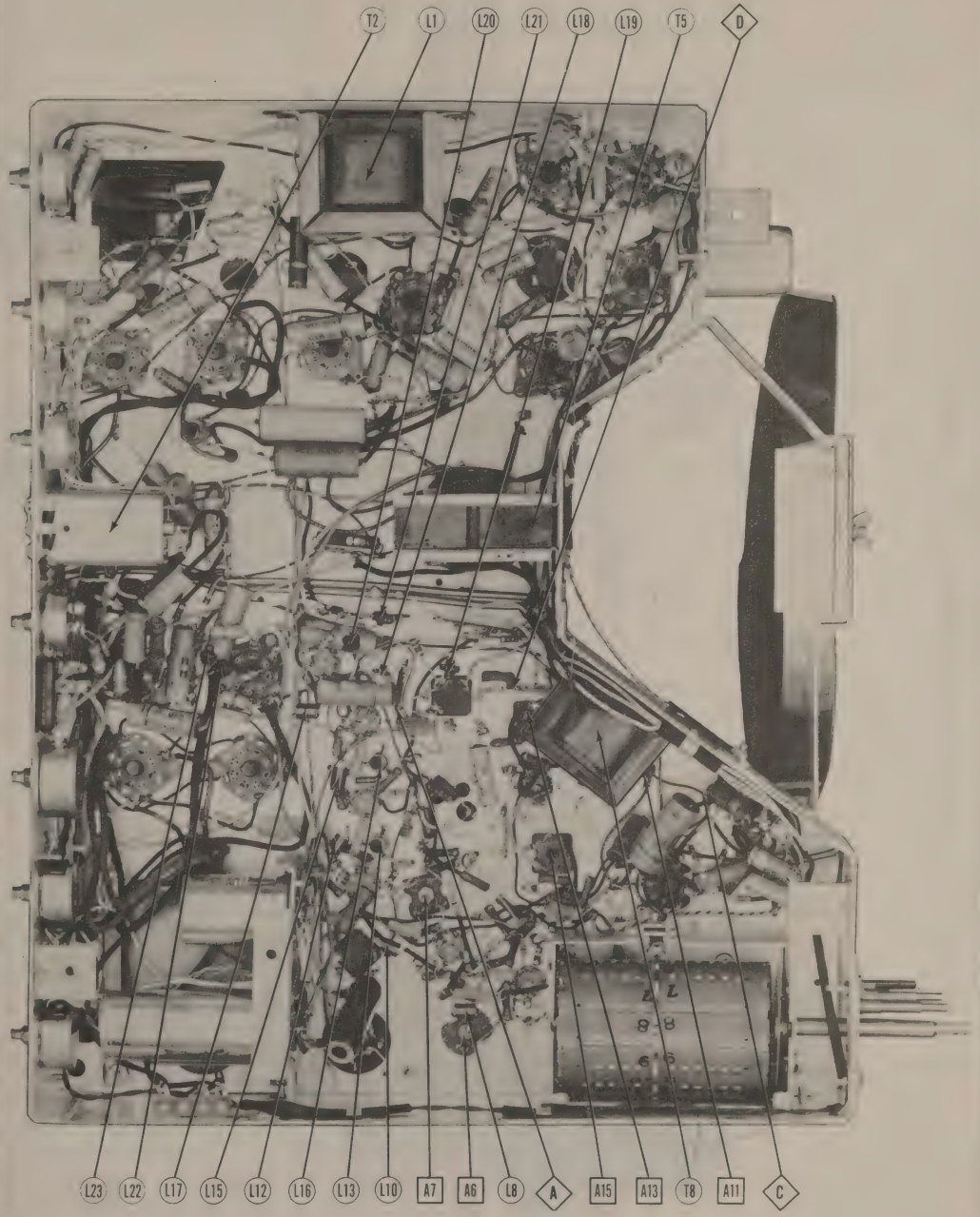
| ITEM No. | RATING: CAP. | RATING: VOLT | IDENTIFICATION |
|---|---|---|---|
| C601 | 10 | | Fixed Trimmer |
| C602 | 10 | | Fixed Trimmer |
| C603 | 1500 | | RF Bypass |
| C604 | 270 | | RF Coupling |
| C605 | 270 | | RF Coupling |
| C606 | 1.5 | | Neutralizing |
| C607 | 1.5 | | Neutralizing |
| C608 | .68 | | RF Coupling |
| C609 | 4.7 | | RF Coupling |
| C610 | 2.2 | | RF Coupling |
| C611 | 1500 | | RF Decoupling |
| C612 | 22 | | Fixed Trimmer |
| C613 | 1500 | | Osc. Decoupling |
| C614 | 10 | | Fixed Trimmer |
| C615 | 4.7 | | Osc. Feedback |
| C616 | 4.7 | | Osc. Feedback |
| C617 | 150 | | Filament Bypass |
| C618 | 1500 | | Mixer Decoupling |
| C619 | 68 | | Fixed Trimmer |

## RESISTORS

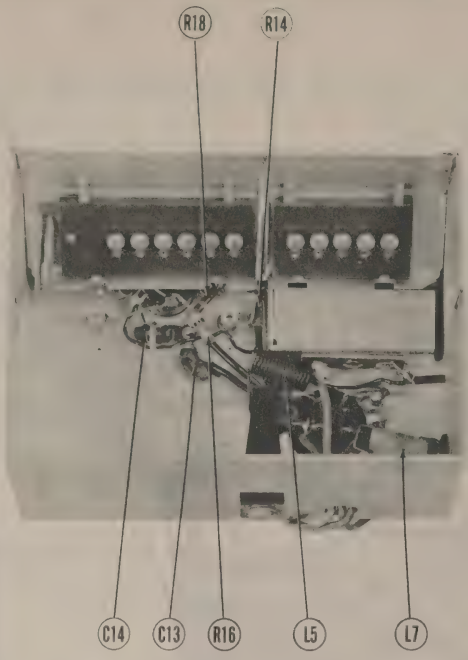
| ITEM No. | RATING: RESISTANCE | RATING: WATTS | IDENTIFICATION |
|---|---|---|---|
| R601 | 150Ω | ½ | RF Grid |
| R602 | 150Ω | ½ | RF Grid |
| R603 | 1000Ω | ½ | Bias Filter |
| R604 | 4700Ω | ½ | RF Plate |
| R605 | 4700Ω | ½ | RF Plate |
| R606 | 1000Ω | ½ | RF Decoupling |
| R607 | 1 Meg. | ½ | Mixer Grid |
| R608 | 10KΩ | ½ | Mixer Grid Shunt |
| R609 | 1000Ω | ½ | Mixer Decpupling |
| R610 | 150Ω | ½ | Decoupling |
| R611 | 4700Ω | ½ | Osc. Plate |
| R612 | 47Ω | ½ | Osc. Cathode |
| R613 | 100KΩ | ½ | Osc. Grid |
| R614 | 100KΩ | ½ | Osc. Grid |

## COILS

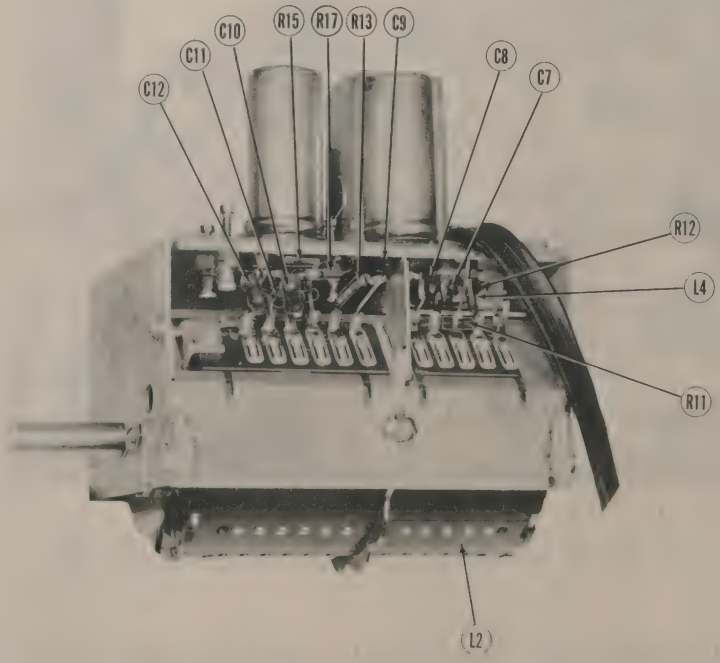
| ITEM No. | USE | DC RES.: PRI. | DC RES.: SEC. | |
|---|---|---|---|---|
| L601 | Ant. Input | 0Ω | | |
| L602 | Interference Trap | 0Ω | | |
| L603 | Interference Trap | 0Ω | | |
| L604 | Filament Choke | 0Ω | | |
| L605 | Mixer Grid Trap | 0Ω | | |
| L606 | 1st. Video IF and Sound Trap | .2Ω | 0Ω | |



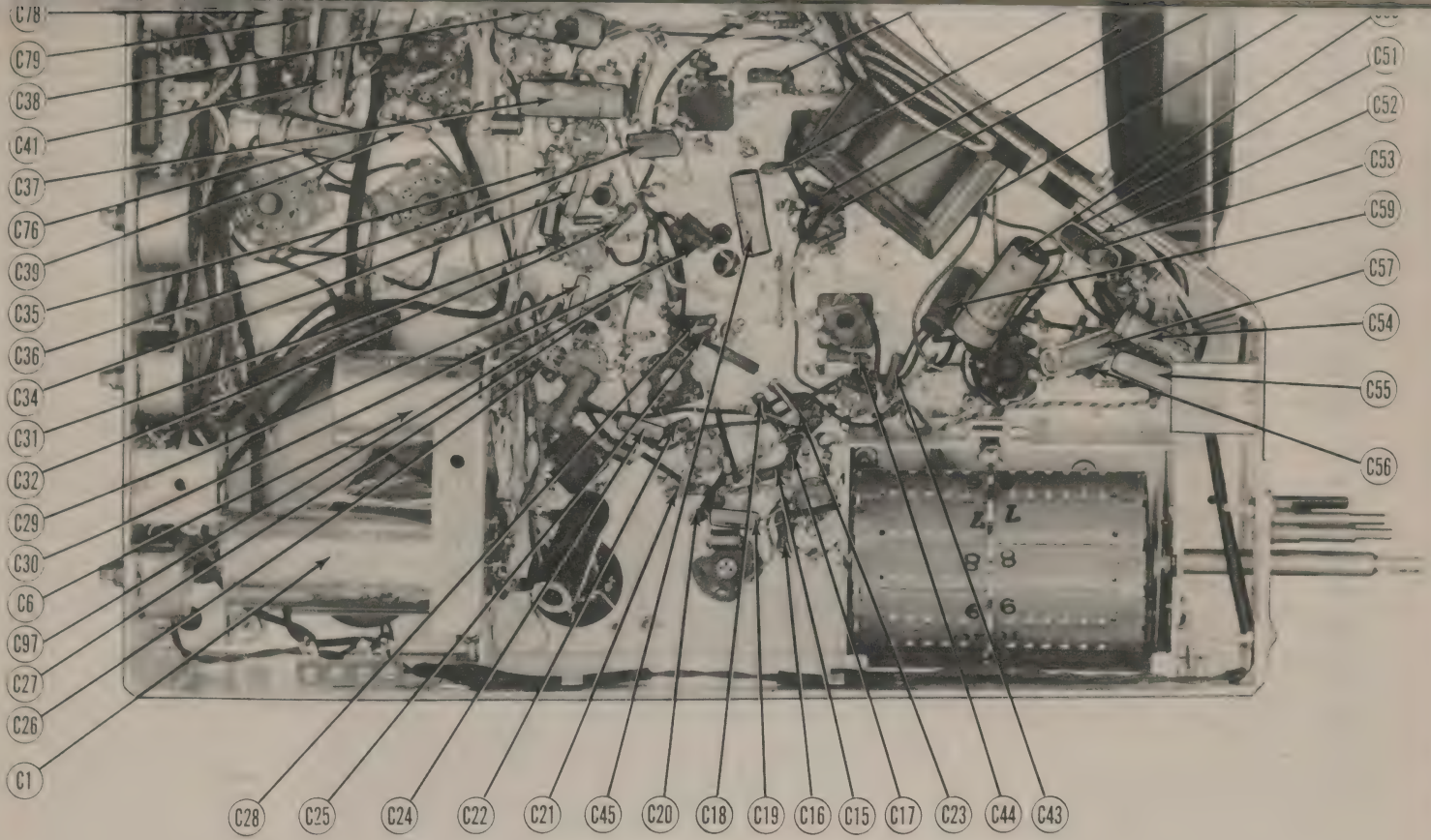

CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION



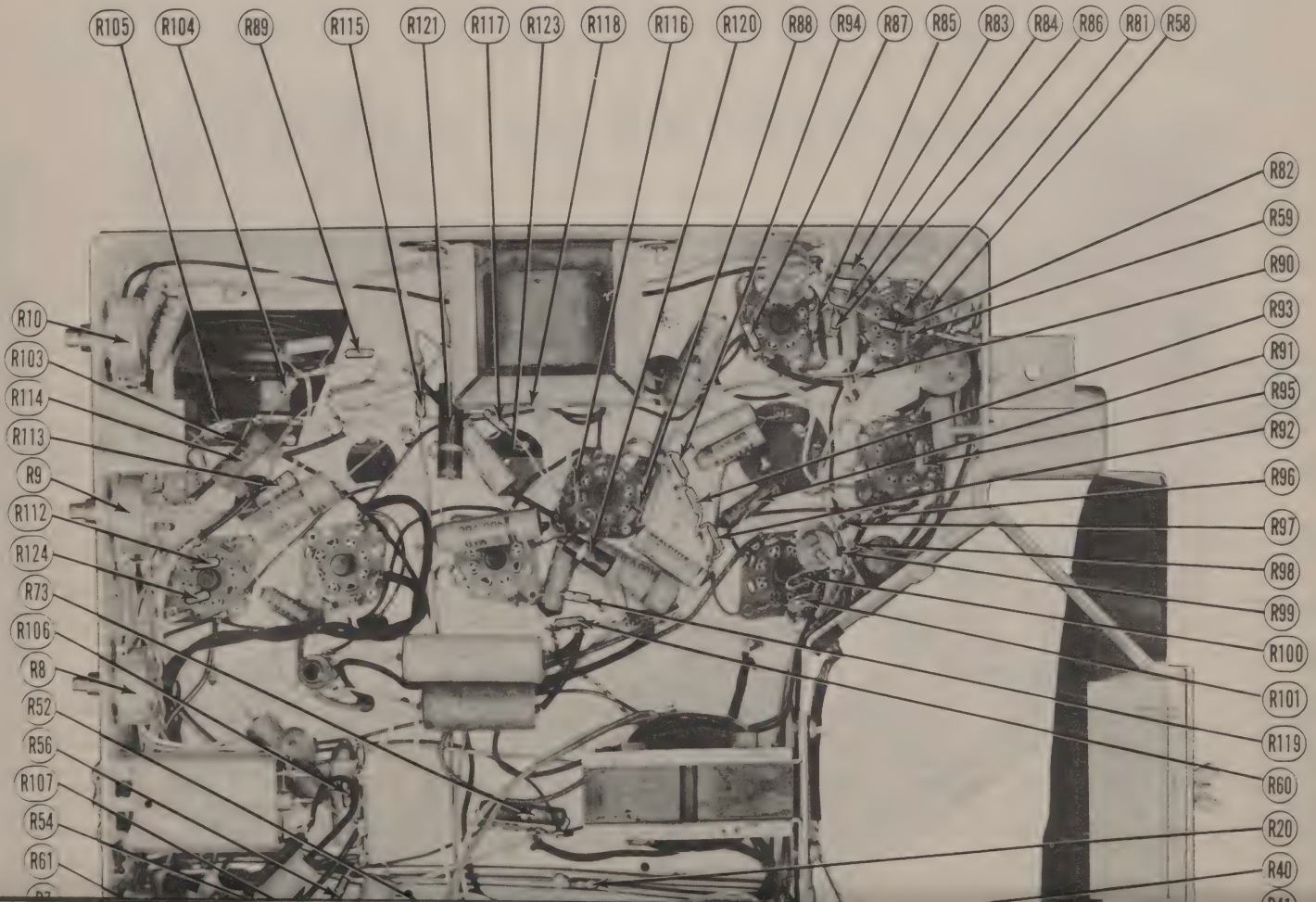

RF TUNER-LEFT SIDE




RF TUNER-RIGHT SIDE




CHASSIS BOTTOM VIEW–CAPACITOR IDENTIFICATION


R105
R104
R89
R115
R121
R117
R123
R118
R116
R120
R88
R94
R87
R85
R83
R84
R86
R81
R58
R82
R59
R90
R93
R91
R95
R92
R96
R97
R98
R99
R100
R101
R119
R60
R20
R40
R10
R103
R114
R113
R9
R112
R124
R73
R106
R8
R52
R56
R107
R54
R61

CHASSIS TOP VIEW

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: HOFFMAN PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| V1 | RF Amp. | | 6AS6 | 7BD | |
| V2 | Converter | | 6J6 | 7BF | |
| V4 | 1st Video IF | | 6AG5 | 7BD | |
| V5 | 2nd Video IF | | 6AG5 | 7BD | |
| V6 | 3rd Video IF | | 6AG5 | 7BD | |
| V7 | 4th Video IF | | 6AG5 | 7BD | |
| V8 | Video Det.-DC Rest. | | 6AL5 | 6BT | |
| V9 | Video Amp. | | 6AU6 | 7BK | |
| V10 | Video Output | | 6K6GT | 7S | |
| V11 | 1st Sound IF | | 6BA6 | 7BK | |
| V12 | 2nd Sound IF | | 6BA6 | 7BK | |
| V13 | 3rd Sound IF | | 6AU6 | 7BK | |
| V14 | Disc. | | 6AL5 | 6BT | |
| V15 | Audio Amp. | | 6AT6 | 7BT | |
| V16 | Audio Output | | 6V6GT | 7AC | |
| V17 | 1st Sync. Amp. | | 6SK7 | 8N | |
| V18 | Sync. Sep. | | 6SH7 | 8BK | |
| V19 | 2nd Sync. Amp.-Horiz. Disch. | | 6SN7GT | 8BD | |
| V20 | Vert. Osc. & Disch. | | 6J5 | 6Q | |
| V21 | Vert. Output | | 6K6GT | 7S | |
| V22 | Horiz. Sync. Disc. | | 6AL5 | 6BT | |
| V23 | Horiz. Reactance | | 6AC7 | 8N | |
| V24 | Horiz. Osc. | | 6K6GT | 7S | |
| V25 | Horiz. Output | | 6BQ6G | 5BT | |
| V26 | Damper | | 6V4G | 9L | |
| V27 | HV Rect. | | 1B3GT | 3C | |
| V28 | LV Rect. | | 5U4G | 5T | |
| V29 | LV Rect. | | 5U4G | 5T | |
| V30 | Picture Tube | | 10BP4 | | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | HOFFMAN PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | 40 | 450 | T4204 | AF4444J | UP9CJ | | | TVL-30 | ◓ Filter |
| B | 40 | 450 | | PRS450/10 | 897 | | | | ■ Filter |
| C | 10 | 450 | | | | | | | Filter |
| C2A | 40 | 450 | T4203 | AFH82J16D | UP9CJ | | | TVL-25 | ◓ Filter |
| B | 10 | 450 | | | 729 | | | | ■ Decoupling |
| C | 80 | 150 | | | | | | | ▲ Bias Filter |
| C3A | 20 | 450 | T4201 | AF4444J | UP8BJ | | | TVL-16 | ◓ Filter |
| B | 80 | 350 | | | 337 | | | | ▲ Filter |
| C4A | 40 | 450 | T4202 | AF4444J | UP9CJ | | | TVL-53 | ◓ Filter |
| B | 10 | 450 | | | 731 | | | | ■ Low Pass Filter |
| C | 10 | 350 | | | | | | | ▲ Decoupling |
| C5A | 80 | 450 | T4205 | AF88J | UP9BJ | | | TVL-18 | ◓ Filter |
| B | 50 | 50 | | PRS50/150 | 730 | | | | ▲ Vert. Output Cath.Byp |
| C6A | 250 | 10 | T4206 | PRS12/250 | UP7BJ | | | TVL-66 | ◓ Hor. Cent. Bypass |
| B | 1000 | 6 | | PRS6/1000 | 808 | | | | ▲ Vert. Cent. Bypass |
| C7 | 5 | | | | | NPOK-5 | | | Fixed Trimmer |
| C8 | 1000 | | | | | GP2L-001 | | | RF Fil. Bypass |
| C9 | 120 | | | | | GP2K-150 | | | RF Decoupling |
| C10 | 100 | | | | | GP1K-100 | | | RF Coupling |
| C11 | 20 | | | | | NPOK-20 | | | Osc. Grid Cap. |
| C12 | 10 | | | | | NPOK-10 | | | Osc. Feedback |
| C13 | 1000 | | | | | GP2L-001 | | | RF Bypass |
| C14 | 1000 | | | | | GP2L-001 | | | Conv. Fil. Bypass |
| C15 | 1500 | | T4007 | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | Bias Filter |
| C16 | 1500 | | T4007 | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | 1st V. IF Fil. Bypass |
| C17 | 1500 | | T4007 | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | 1st V. IF Decoupling |
| C18 | 1500 | | T4007 | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | Decoupling |
| C19 | 270 | 500 | T4004 | 1468-00025 | 5W5T25 | GP2K-250 | MO.5-325 | 1FM-325 | IF Coupling |
| C20 | 1500 | | T4007 | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | Bias Filter |
| C21 | 1500 | | T4007 | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | 2nd V. IF Fil. Bypass |
| C22 | 1500 | | T4007 | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | 2nd V. IF Decoupling |
| C23 | 1500 | | T4007 | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | Decoupling |
| C24 | 270 | 500 | T4004 | 1468-00025 | 5W5T25 | GP2K-250 | MO.5-325 | 1FM-325 | IF Coupling |
| C25 | 1500 | | T4007 | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | Bias Filter |
| C26 | 1500 | | T4007 | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | 3rd V. IF Fil. Bypass |
| C27 | 1500 | | T4007 | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | 3rd V. IF Decoupling |
| C28 | 1500 | | T4007 | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | Decoupling |
| C29 | 270 | 500 | T4004 | 1468-00025 | 5W5T25 | GP2K-250 | MO.5-325 | 1FM-325 | IF Coupling |
| C30 | 82 | | T4003 | | | | | | 4th V. IF Cath. Byp.±5% |
| C31 | 1500 | | T4007 | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | 4th V. IF Fil. Byp. |
| C32 | 1500 | | T4007 | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | 4th V. IF Decoupling |
| C33 | .25 | 400 | T4113 | P488-25 | GT4P25 | | ST-4-25 | TC-2 | RF Bypass |
| C34 | 270 | 500 | T4004 | 1468-00025 | 5W5T25 | GP2K-250 | MO.5-325 | 1FM-325 | IF Coupling |
| C35 | 1500 | | T4007 | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | V. Det. Fil. Bypass |
| C36 | 10 | 500 | T4000 | 1468-00001 | 5W5Q1 | GP1K-10 | MO.5-41 | MS-41 | Diode Filter |
| C37 | .05 | 400 | T4111 | P488-05 | GT4S5 | | ST-4-05 | TM-15 | Video Coupling |
| C38 | .05 | 400 | T4111 | P488-05 | GT4S5 | | ST-4-05 | TM-15 | " |
| C39 | 470 | 500 | T4010 | 1468-0005 | 5W5T5 | GP2K-500 | MO.5-33 | 1FM-33 | Video Output Cath. Byp. |
| C40 | .05 | 400 | T4111 | P488-05 | GT4S5 | | ST-4-05 | TM-15 | Video Coupling |
| C41 | .05 | 400 | T4111 | P488-05 | GT4S5 | | ST-4-05 | TM-15 | " |
| C42 | .25 | 400 | T4113 | P488-25 | GT4P25 | | ST-4-25 | TC-2 | Brightness Cont. Byp. |
| C43 | 1500 | | T4007 | 1468-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | 1st S. IF Cath. Byp. |
| C44 | 1500 | | T4007 | 1468-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | 1st S. IF Decoupling |
| C45 | .01 | 400 | T4106 | P488-01 | GT4S1 | GP2-335-01 | ST-4-01 | TM-11 | 2nd S. IF Grid Filter |
| C46 | 1500 | | T4007 | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | 2nd S. IF Cath. Bypass |
| C47 | 1500 | | T4007 | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | 2nd S. IF Screen Bypass |
| C48 | 1500 | | T4007 | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | 2nd S. IF Plate Dec. |
| C49 | 51 | | T4041 | 1468-00005 | 5W5Q5 | GP1K-50 | MO.5-45 | 1FM-45 | 3rd S. IF Grid Filter |
| C50 | 6500 | | T4009 | 1467-006 | 1D5D7 | GP2-335-01 | MW.5-26 | 1FM-27 | 3rd S. IF Decoupling |
| C51 | 270 | 500 | T4014 | 1468-00025 | 5W5T25 | GP2K-250 | MO.5-325 | 1FM-325 | RF Bypass |
| C52 | .002 | 400 | T4101 | P688-002 | GT5D2 | GP2M-002 | ST-5-002 | TM-22 | De-emphasis |
| C53 | .01 | 400 | T4106 | P488-01 | GT4S1 | GP2-335-01 | ST-4-01 | TM-11 | Audio Coupling |
| C54 | .01 | 400 | T4106 | P488-01 | GT4S1 | GP2-335-01 | ST-4-01 | TM-11 | " |
| C55 | .01 | 400 | T4106 | P488-01 | GT4S1 | GP2-335-01 | ST-4-01 | TM-11 | Tone Comp. |

## PARTS LIST AN

| ITEM No. | RATING: CAP. | RATING: VOLT | HOFFMAN PART No. | AEROVOX PART No. | REPLACEMENT CORNELL-DUBILIER PART No. |
|---|---|---|---|---|---|
| C56 | 100 | 500 | T4013 | 1468-001 | 5W5T1 |
| C57 | .02 | 400 | T4120 | P488-02 | GT4S2 |
| C58 | .2 | 200 | | 484-.2 | GT4P2 |
| C59 | .01 | 600 | T4106 | P688-01 | GT6S1 |
| C60 | .05 | 400 | T4111 | P488-05 | GT4S5 |
| C61 | 270 | 1000 | T4014 | | |
| C62 | 270 | 500 | T4004 | 1468-00025 | 5W5T25 |
| C63 | .1 | 600 | T4119 | P688-1 | GT6P1 |
| C64 | .05 | 600 | T4116 | P688-05 | GT6S5 |
| C65 | .01 | 400 | T4114 | P488-01 | GT4S1 |
| C66 | .002 | 400 | T4101 | P488-002 | GT5D2 |
| C67 | .005 | 400 | T4116 | P688-005 | GT6D5 |
| C68 | .005 | 400 | T4116 | P688-005 | GT6D5 |
| C69 | 4700 | 500 | T4008 | | |
| C70 | .05 | 600 | T4118 | P688-05 | GT6S5 |
| C71 | .1 | 400 | T4115 | P488-1 | GT4P1 |
| C72 | 82 | 500 | T4002 | | |
| C73 | .015 | 400 | T4108 | P488-015 | GT6S15 |
| C74 | .004 | 1000 | T4103 | P1088-004 | GT16D4 |
| C75 | .05 | 400 | T4111 | P488-05 | GT4S5 |
| C76 | .05 | 600 | T4118 | P688-05 | GT6S5 |
| C77 | .004 | 1000 | T4103 | P1088-004 | GT16D4 |
| C78 | .015 | 400 | T4108 | P488-015 | GT6S15 |
| C79 | 1200 | | T4011 | | |
| C80 | .004 | 400 | T4104 | P688-004 | GT6D4 |
| C81 | 390 | 500 | T4005 | 1469-0004 | 5R5T4 |
| C82 | .01 | 400 | T4106 | P488-01 | GT4S1 |
| C83 | .05 | 600 | T4118 | P688-05 | GT6S5 |
| C84 | 680 | 500 | T4006 | 1479-0007 | 2R5T7 |
| C85 | .001 | 1000 | T4100 | P1088-001 | GT16D1 |
| C86 | .1 | 400 | T4112 | P488-1 | GT4P1 |
| C87 | .05 | 400 | T4111 | P488-05 | GT4S5 |
| C88 | .05 | 1000 | T4117 | P1088-05 | GT16S5 |
| C89 | .035 | 1000 | T4105 | | |
| C90 | 500 | 10000 | T4200 | | |
| C91 | 15 | | | | |
| C92 | 15 | | | | |
| C93 | 43 | | | 1469-00004 | 5R5Q4 |
| C94 | 75 | | | 1469-000075 | 5R5Q7 |
| C95 | .01 | 600 | T4107 | P688-01 | GT6S1 |
| C96 | .01 | 600 | T4107 | P688-01 | GT6S1 |
| C97 | 1500 | | T4007 | 1467-0015 | 1W5D15 |

* Some models use .01MFD in this appli
† Not used in all models.

## CO

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: HOFFMAN PART No. | REPLACEMENT DATA: IRC PART No. | REPLACEMENT DATA: CLA PAR |
|---|---|---|---|---|---|
| R1A | 50KΩ | ½ | T4309 | D13-137 | M-50 |
| B | Shaft | | Not Req. | A | Not |
| R2A | 10KΩ | ½ | T4301 | | |
| B | 1 Meg. | | | | |
| R3A | 1 Meg. | ½ | T4304 | | |
| B | 50KΩ | | | | |
| R4 | 20Ω | 1 | T4308 | W-20 | 43-2 |
| R5 | 20Ω | 1 | T4305 | W20X10 | 43-2 |
| R6 | 1500Ω | 2 | T4302 | W-1500 | 43-1 |
| R7A | 5000Ω | ½ | T4307 | D11-114 | M-19 |
| B | Shaft | | Not Req. | A | Not |
| R8 | 2.5 Meg. | ½ | T4306 | | M-43 |
| R9A | 50KΩ | ½ | T4300 | D11-123 | M-44 |
| B | Shaft | | Not Req. | A | Not |
| R10A | 2KΩ | ½ | T4303 | D11-120 | M-40 |
| B | Shaft | | Not Req. | A | Not |

## RES

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: HOFFMAN PART No. | REPLACEMENT DATA: IRC PART No. |
|---|---|---|---|---|
| R11 | 3900Ω | ½ | | BTS-3900 |
| R12 | 47KΩ | | | BTS-47K |
| R13 | 10KΩ | | | BTS-10K |
| R14 | 2200Ω | | | BTS-2200 |
| R15 | 10KΩ | | | BTS-10K |
| R16 | 4700Ω | | | BTS-4700 |
| R17 | 470Ω | | | BTS-470 |
| R18 | 220KΩ | | | BTS-220K |
| R19 | 3900Ω | | | BTS-3900 |
| R20 | 3900Ω | | | BTS-3900 |
| R21 | 5KΩ | 5 | T4704 | A5-5000 |
| R22 | 680KΩ | | T4043 | BTS-680K |
| R23 | 10KΩ | | T4309 | BTS-10K |
| R24 | 10KΩ | | T4127 | BTS-10K-5% |
| R25 | 1000Ω | | T4112 | BTS-1000 |
| R26 | 39Ω | | T4003 | |
| R27 | 150Ω | | T4007 | DW-½-150 |
| R28 | 1KΩ | | T4107 | BW-½-1K |
| R29 | 1KΩ | | T4007 | BW-½-1K |
| R30 | 1KΩ | | T4007 | BW-½-1K |
| R31 | 1000Ω | | T4112 | BTS-1000 |
| R32 | 1000Ω | | T4112 | BTS-1000 |
| R33 | 10KΩ | | T4127 | BTS-10K-5% |
| R34 | 39Ω | | T4003 | |
| R35 | 1000Ω | | T4112 | BTS-1000 |
| R36 | 4700Ω | | T4120 | BTS-4700-5% |
| R37 | 39Ω | | T4003 | |
| R38 | 2700Ω | | T4130 | BTS-2700-5% |
| R39 | 1000Ω | | T4112 | BTS-1000 |

# DESCRIPTIONS

| o. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|
| 0 | M.5-21 | 1FM-21 | AF Plate Bypass |
| | ST-4-2 | TM-12 | Audio Coupling |
| | ST-4-.2 | CM-10 | Audio Feedback* |
| | ST-4-01 | TM-11 | Output Plate Bypass † |
| | ST-4-05 | TM-15 | Sync. Coupling |
| 0 | M.5-.22 | 1FM-.025 | 1st Sync. Amp. Plate Byp<br>Sync. Coupling |
| | ST-4-1 | TM-1 | 1st Sync. Amp. Plate Dec |
| | ST-4-05 | TM-15 | Sync. Coupling |
| -01 | ST-4-01 | TM-11 | Vert. Sync. Coupling |
| 2 | ST-4-002 | TM-22 | Integrator Net. |
| 5 | ST-6-015 | TM-25 | " " |
| 5 | ST-6-005 | TM-25 | " " |
| | | | Vert. Osc. Grid Cap. |
| | ST-6-05 | TM-15 | Vert. Discharge |
| | ST-4-1 | TM-1 | Vert. Coupling |
| | | | Hor. Sync. Coupling |
| | | | Fixed Trimmer |
| | STM-16-004 | MB-24 | Sync. Coupling |
| | ST-4-05 | TM-15 | AFC Filter |
| | ST-6-05 | TM-15 | Hor. Osc. Cont. Screen Byp. |
| | STM-16-004 | MB-24 | AFC Coupling |
| | | | Phase Shifter |
| | | | " " |
| | ST-6-004 | TM-24 | Hor. Osc. Grid Cap. |
| | MOS.5-34 | MS-34 | Differentiator Net. |
| -01 | ST-4-01 | TM-11 | Hor. Osc. Coupling |
| | ST-6-05 | TM-15 | Hor. Osc. Screen Bypass |
| | MWS.5-37 | MS-37 | Hor. Discharge ± 5% |
| | STM-16-001 | TR-21 | Hor. Sweep Coupling |
| | ST-4-1 | TM-1 | Hor. Output Cath. Byp. |
| | ST-4-05 | TM-15 | Hor. Output Screen Byp |
| | STM-10-05 | TR-16 | Damper Filter |
| | | | Damper Filter ± 5% |
| | | | HV Filter Tn. Oxide |
| | | | Fixed Trimmer † |
| | | | " " |
| | MOS.5-44 | MS-44 | " " |
| 5 | MOS.5-47 | MS-47 | " " |
| | ST-6-01 | TM-11 | Line Filter |
| | ST-6-01 | TM-11 | " " |
| 15 | MW.5-215 | 1FM-215 | RF Bypass |

## LS

| INSTALLATION NOTES | |
|---|---|
| Tone control | |
| Attach to R1A Per Instructions | |
| Contrast control | Dual concentric |
| Volume control & SW. | |
| Vert. Hold control | Dual concentric |
| Brightness control | |
| Horiz. centering control | |
| Vert. centering control | |
| Focus control | |
| Vert. Linearity control | |
| Attach to R7A Per Instructions | |
| Height control | |
| Horiz. hold control | |
| Attach to R9A Per Instructions | |
| Horiz. drive control | |
| Attach to R10A Per Instructions | |

## RS

| IDENTIFICATION CODES | |
|---|---|
| Resistors are ± 10% unless otherwise stated. | |
| Mid | 20% |
| " | 20% |
| Mil Shunt | 20% |
| Splice | 20% |
| Grid | 20% |
| Plate Load | 20% |
| " Grid | |
| " | 20% |
| Voltage Divider See Note 1 | |
| " " " " " | |
| Splice | |
| Voltage Divider See Note 2 | |
| " " " " | |
| Video IF Grid | 5% |
| Video IF Decoupling | 20% |
| Video IF Cathode | |
| Splice See Note 2 | 20% |
| " | 20% |
| " | 20% |
| " | 20% |
| Network | |
| " | |
| Video IF Grid | 5% |
| Video IF Cathode | |
| Video IF Decoupling | 20% |
| Video IF Grid | 5% |
| Video IF Cathode | |
| Video IF Plate | 5% |
| Video IF Decoupling | 20% |

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA HOFFMAN PART No. | REPLACEMENT DATA IRC PART No. | IDENTIFICATION CODES | |
|---|---|---|---|---|---|---|
| R40 | 10KΩ | ½ | T4528 | BTS-10K | Bias Voltage Divider | |
| R41 | 82000Ω | ½ | T4525 | BTS-8200 | Bias Net. | |
| R42 | 27000Ω | ½ | T4515 | BTS-2700 | " " | |
| R43 | 680Ω | ½ | T4511 | BTS-680 | Bias Voltage Divider | |
| R44 | 150Ω | ½ | T4507 | BW-½-150 | 4th Video IF Cathode | 20% |
| R45 | 5600Ω | ½ | T4522 | BTS-5600-5% | 4th Video IF Plate | 5% |
| R46 | 1000Ω | ½ | T4512 | BTS-1000 | 4th Video Plate Decoupling | 20% |
| R47 | 3900Ω | ½ | T4518 | BTS-3900-5% | Video Det. Load | 5% |
| R48 | 470KΩ | ½ | T4542 | BTS-470K-5% | Video Amp. Grid | |
| R49 | 3300Ω | ½ | T4516 | BTS-3300 | Video Amp. Plate | |
| R50 | 6800Ω | ½ | T4524 | BTS-6800 | Video Amp. Plate Decoupling | |
| R51 | 820KΩ | ½ | T4544 | BTS-820K-5% | Video Output Grid | 5% |
| R52 | 1.2 Meg. | ½ | T4547 | BTS-1.2Meg-5% | Bias Network | 5% |
| R53 | 330Ω | ½ | T4506 | BTA-330 | Video Output Cathode | |
| R54 | 3300Ω | 1 | T4517 | BTA-3300 | Video Output Plate | |
| R55 | 10KΩ | ½ | T4550 | BTS-10K | Phase Correction | |
| R56 | 100KΩ | ½ | T4537 | BTS-100K | Picture Tube Grid | 20% |
| R57 | 1 Meg. | ½ | T4546 | BTS-1 Meg. | DC Restorer Load | 20% |
| R58 | 47KΩ | ½ | T4535 | BTS-47K | " " " | |
| R59 | 150KΩ | ½ | T4538 | BTS-150K | Bias Network | |
| R60 | 22KΩ | ½ | T4529 | BTS-22K | Voltage Divider | |
| R61 | 150KΩ | ½ | T4538 | BTS-150K | Accellerating Anode Dropping | |
| R62 | 100Ω | ½ | T4505 | | 1st Sound IF Cathode | 20% |
| R63 | 1000Ω | ½ | T4512 | BTS-1000 | 1st Sound IF Decoupling | |
| R64 | 470KΩ | ½ | T4542 | BTS-470K | 2nd Sound IF Grid | |
| R65 | 100Ω | ½ | T4505 | | 2nd Sound IF Cathode | |
| R66 | 3300Ω | ½ | T4516 | BTS-3300 | 2nd Sound IF Screen Decoupling | 20% |
| R67 | 1000Ω | ½ | T4512 | BTS-1000 | 2nd Sound IF Plate Decoupling | 20% |
| R68 | 22KΩ | ½ | T4560 | BTS-22K | 3rd Sound IF Grid | |
| R69 | 10KΩ | 1 | T4558 | BTA-10K | 3rd Sound IF Decoupling | |
| R70 | 10KΩ | ½ | T4559 | BTS-10K | 3rd Sound IF Bleeder | |
| R71 | 100KΩ | ½ | T4562 | BTS-100K | Disc. Load | |
| R72 | 100KΩ | ½ | T4562 | BTS-100K | " " | |
| R73 | 2.2Ω | 1 | T4500 | BW-1-2.2 | Filament Dropping | |
| R74 | 22KΩ | ½ | T4529 | BTS-22K | De-emphasis | |
| R75 | 10 Meg. | ½ | T4552 | BTS-10 Meg. | AF Grid | |
| R76 | 220KΩ | ½ | T4563 | BTS-220K | AF Plate | |
| R77 | 1 Meg. | ½ | T4546 | BTS-1 Meg. | Output Grid | |
| R78 | 470KΩ | ½ | T4542 | BTS-470K | Bias Network | |
| R79 | 1000Ω | 10 | T4705 | AB-1000 | Filter | |
| R80 | 47KΩ | ½ | T4535 | BTS-47K | " | 5% |
| R81 | 6.8 Meg. | ½ | T4551 | BTS-6.8Meg-5% | Bias Network | |
| R82 | 1 Meg. | ½ | T4565 | BTS-1 Meg. | Sync. Amp. Grid | |
| R83 | 4700Ω | 1 | T4518 | BTA-4700 | Sync. Amp. Plate | |
| R84 | 4700Ω | 1 | T4519 | BTA-4700 | Sync. Amp. Decoupling | |
| R85 | 1 Meg. | ½ | T4565 | BTS-1 Meg. | Sync. Sep. Grid | |
| R86 | 4.7 Meg. | ½ | T4550 | BTS-4.7 Meg. | Bias Network | |
| R87 | 6800Ω | ½ | T4524 | BTS-6800 | Sync. Sep. Plate | |
| R88 | 1 Meg. | ½ | T4565 | BTS-1 Meg. | 2nd Sync. Amp. Grid | |
| R89 | 4700Ω | ½ | T4556 | BTS-4700 | 2nd Sync. Amp. Plate | |
| R90 | 1000Ω | ½ | T4554 | BTS-1000 | 2nd Sync. Amp. Decoupling | |
| R91 | 22KΩ | ½ | T4529 | BTS-22K | Differentiator | 20% |
| R92 | 22KΩ | ½ | T4529 | BTS-22K | Integrator Network | 20% |
| R93 | 8200Ω | ½ | T4525 | BTS-8200 | " " | |
| R94 | 8200Ω | ½ | T4525 | BTS-8200 | " " | |
| R95 | 1.5 Meg. | ½ | T4548 | BTS-1.5Meg-5% | Vert. Osc. Grid | 5% |
| R96 | 100KΩ | ½ | T4562 | BTS-100K | Voltage Divider | |
| R97 | 2.2 Meg. | ½ | T4549 | BTS-2.2 Meg. | " " | |
| R98 | 220KΩ | ½ | T4539 | BTS-220K | Vert. Osc. Plate | |
| R99 | 2.2 Meg. | ½ | T4549 | BTS-2.2 Meg. | Vert. Output Grid | |
| R100 | 8200Ω | ½ | T4557 | BTS-8200-5% | Vert. Peaking | 5% |
| R101 | 2700Ω | ½ | T4515 | BTS-2700 | Vert. Output Cathode | |
| R102 | 10KΩ | 1 | T4526 | BTA-10K | Vert. Output Plate Decoupling | |
| R103 | 470KΩ | ½ | T4561 | BTS-470K | Horiz. AFC Filter | |
| R104 | 1 Meg. | ½ | T4565 | BTS-1 Meg. | Horiz. Disc. Load | |
| R105 | 470KΩ | ½ | T4561 | BTS-470K | " " " | |
| R106 | 470KΩ | ½ | T4561 | BTS-470K | " " " | |
| R107 | 560Ω | ½ | T4510 | BTS-560 | Grid Current Limiter | |
| R108 | 10Ω | 1 | T4502 | | Horiz. AFC Cathode | |
| R109 | 27KΩ | 1 | T4531 | BTA-27K | Horiz. AFC Bleeder | |
| R110 | 39KΩ | 1 | T4561 | BTA-39K-5% | Horiz. AFC Screen | 5% |
| R111 | 22KΩ | ½ | T4526 | BTS-22K | Horiz. AFC Plate | 20% |
| R112 | 27KΩ | ½ | T4532 | BTS-27K | Horiz. Osc.Grid | |
| R113 | 10KΩ | 1 | T4558 | BTA-10K | Horiz. Osc. Screen Decoupling | |
| R114 | 5000Ω | 5 | T4704 | AB-5000 | Horiz. Osc. Plate | |
| R115 | 6800Ω | ½ | T4524 | BTS-6800 | Differentiator | |
| R116 | 220KΩ | ½ | T4563 | BTS-220K | Horiz. Disch. Grid | |
| R117 | 680KΩ | ½ | T4543 | BTS-680K-5% | Horiz. Disch. Plate | 5% |
| R118 | 6800Ω | ½ | T4524 | BTS-6800-5% | Horiz. Peaking | 5% |
| R119 | 470KΩ | ½ | T4561 | BTS-470K | Horiz. Output Grid | |
| R120 | 100Ω | 2 | T4506 | | Horiz. Output Cathode | |
| R121 | 10KΩ | 2 | T4566 | BTA-10K | Horiz. Output Screen Decoupling | |
| R122 | 3.3Ω | ½ | T4501 | BW-½-3.3-5% | HV Filament See note 3 | 5% |
| R123 | 1 Meg. | 1 | T4545 | | HV Filter | |
| R124 | 56KΩ | ½ | T4536 | BTS-56K | Decoupling | |
| R125A | 53000Ω | 20 | T4701 | AB-500 | Damper Filter | |
| B | 5000Ω | 2 | | | " " | |
| C | 5000Ω | 2 | | AB-500 | " " | |
| R126A | 93Ω | 4 | T4702 | | Voltage Divider | |
| B | 12Ω | ½ | | BW-1-12 | " " | |
| C | 67500Ω | 4 | | | " " | |
| R127A | 230Ω | 10 | T4700 | | Voltage Divider | |
| B | 1360Ω | 20 | | | " " | |
| R128 | 100Ω | 3 | T4568 | AB-100 | " " | |

Note 1. Used in models employing standard coil tuner.
Note 2. Used in models employing RCA tuner.
Note 3. Not used in all models.
Note 4. R11 thru R21 are used in the standard coil tuner only. Items R22, R23 are used with the RCA tuner only.

## FILTER CHOKE

| ITEM No. | RATINGS TOTAL DIRECT CURRENT | RATINGS D. C. RESISTANCE | RATINGS INDUCTANCE (0 CURRENT 1000 ~) | REPLACEMENT DATA HOFFMAN PART No. | REPLACEMENT DATA STANCOR PART No. | REPLACEMENT DATA CHICAGO PART No. | REPLACEMENT DATA MERIT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| L1 | .310A | 37.5Ω | 1.35 Henry | T5100 | C-2326 | | | |

HOFFMAN MODELS
CT-800 CT-801, CT-900, CT-901

# PARTS LIST AND DESCRIPTIONS (Continued)

## COILS (RF-IF)

| ITEM No. | USE | DC RES. PRI. | DC RES. SEC. | REPLACEMENT DATA HOFFMAN PART No. | REPLACEMENT DATA MEISSNER PART No. | NOTES |
|---|---|---|---|---|---|---|
| L2 | Ant. & RF Grid Coils | 0Ω | | | | Part of tuner Assy. RF-3, are in matched pairs, with channel number stamped on clip. |
| L3 | RF Plate, Mixer Grid & Osc.Coils | 0Ω | | | | Part of tuner Assy. RF-3, are in matched pairs, with channel number stamp on clip. |
| L4 | Fil.Choke | 0Ω | | | | Part of tuner Assy. RF-3 |
| L5 | Fil.Choke | 0Ω | | | | " " " " " |
| L6 | 1st Video IF | 0Ω | 0Ω | | | " " " " " |
| L7 | IF Grid Coke | 0Ω | | | | " " " " " |
| L8 | Fil.Choke | 0Ω | | T5101 | | |
| L9 | 2nd Video IF | .2Ω | 0Ω | T5201 | | |
| L10 | Fil.Choke | 0Ω | | T5101 | | |
| L11 | 3rd Video IF | .2Ω | 0Ω | T5203 | | |
| L12 | Fil.Choke | 0Ω | | T5101 | | |
| L13 | 4th Video IF | .5Ω | | T5204 | | |
| L14 | 4th Video Cath. | .1Ω | 0Ω | T5202 | | |
| L15 | Fil.Choke | | | T5101 | | |
| L16 | Video Det. | .5Ω | | T5204 | | |
| L17 | Fil.Choke | | | T5101 | | |
| L18 | Peaking | 10Ω | | T5207 | | 180 Microhenry coil, wound on 39KΩ res. |
| L19 | Peaking | 9Ω | | T5208 | | Inductance-250 Microhenries |
| L20 | Peaking | 5.5Ω | | T5205 | | 120 Microhenry coil, wound on 22KΩ res. |
| L21 | Peaking | 5Ω | | T5206 | | Inductance-93 Microhenries |
| L22 | Peaking | 5.5Ω | | T5205 | | 120 Microhenry coil, wound on 22KΩ res. |
| L23 | Peaking | 5Ω | | T5206 | | Inductance-93 Microhenies |
| L24 | 1st Sound IF | .1Ω | .1Ω | T-5209 | | |
| L25 | 2nd Sound IF | .1Ω | .1Ω | T5209 | | |
| L26 | Sound Disc. XFMR. | .1Ω | .1Ω | T5210 | | |
| L27 | Width control coil | .2Ω | | T5212 | | |
| L28 | Horiz. Linearity control | 35Ω | | T5211 | | |

## SPEAKER

| ITEM No. | RATING FIELD RES. | RATING V. C. IMP. | REPLACEMENT DATA HOFFMAN PART No. | REPLACEMENT DATA JENSEN PART No. | REPLACEMENT DATA QUAM PART No. | NOTES |
|---|---|---|---|---|---|---|
| SP1 | PM | 3.8Ω | 9015 | ST-102* MOD.P12-S | 12A6 | * Replace output transformer to match 6-8Ω voice coil. |
| | CONE DIA. | V. C. DIA. | | | | |
| SP2 | 11 1/2" | 1" | | | | |

## TRANSFORMER (POWER)

| ITEM No. | RATING PRI. | RATING SEC. 1 | RATING SEC. 2 | RATING SEC. 3 | REPLACEMENT DATA HOFFMAN PART No. | REPLACEMENT DATA STANCOR PART No. | REPLACEMENT DATA CHICAGO PART No. | REPLACEMENT DATA MERIT PART No. |
|---|---|---|---|---|---|---|---|---|
| T1 | [illegible] | 725VCT @ .21ADC SEC. 1 2.5VAC @ 7A | [illegible] SEC. 2 [illegible] VAC @ [illegible] | 5VAC @ 3A | T-5002 | P-8152 | TP-365 | P-3063 |

## TRANSFORMER (SWEEP CIRCUITS)

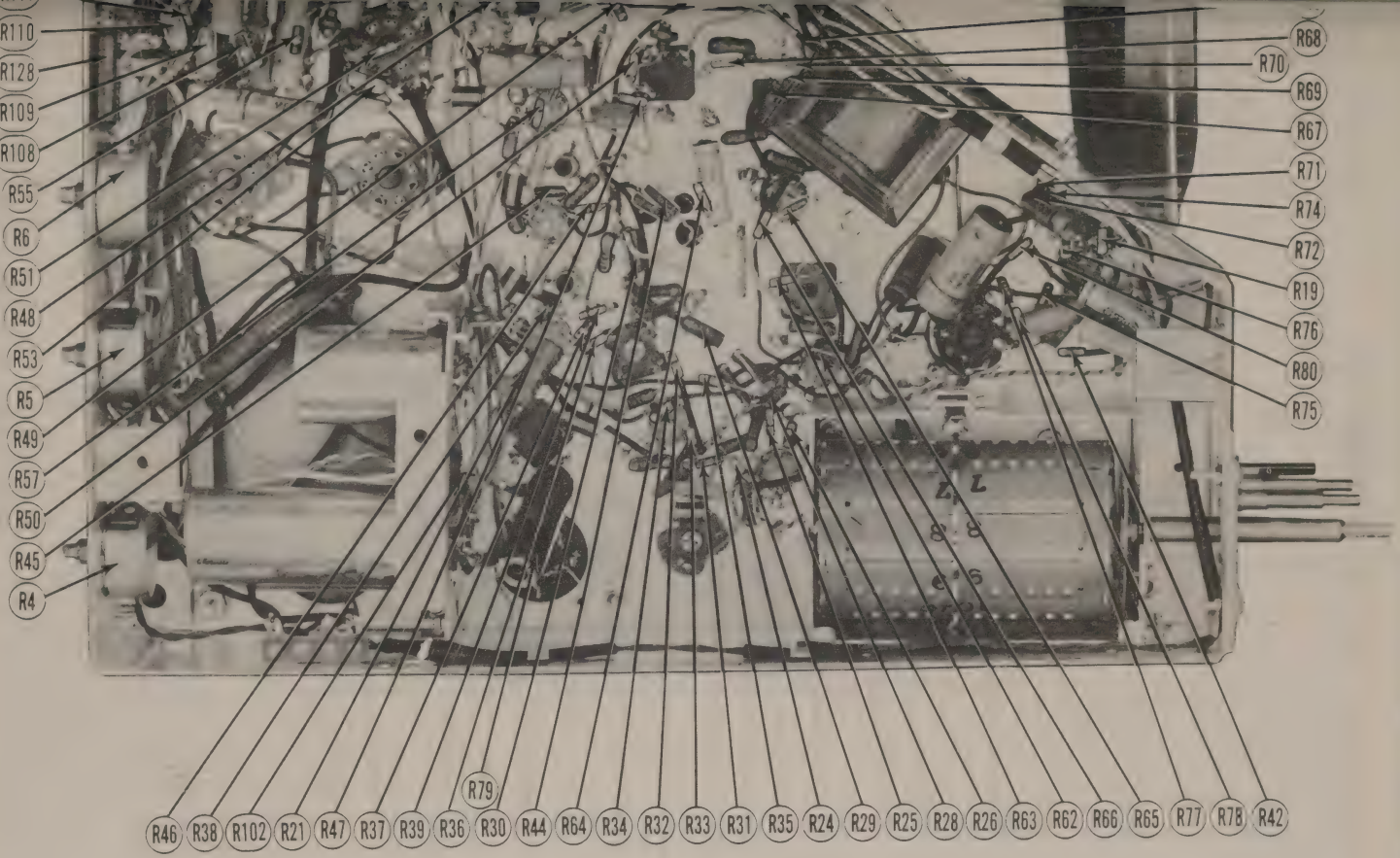
| ITEM No. | RATING DC RESISTANCE PRI. | RATING DC RESISTANCE SEC. | REPLACEMENT DATA HOFFMAN PART No. | REPLACEMENT DATA STANCOR PART No. | REPLACEMENT DATA CHICAGO PART No. | REPLACEMENT DATA MERIT PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| T2 | 40Ω CT | 36Ω Tap @ [illegible] | T5213 | | | | Hor. Sync. Disc. Trans. |
| T3 | 150Ω | 130Ω | T5214 | A-8121 | TBO-1 | A-4000 | Vert. Block Osc.Trans. |
| T4 | 340Ω Tap @ [illegible] | 0Ω SEC.2 @ 7.4Ω @ .2Ω | T5102 | | | | Hor. Output Trans. |
| T5 | [illegible] | [illegible] | T-5[illegible] | A-[illegible] | | A-3[illegible] | Vert. Output Trans. |
| [illegible] | [illegible] | | T5216 | DY-1 | | | Hor. Deflection Yoke |
| [illegible] | [illegible] | | [illegible] | FC-1C | | | Vert. Deflection Yoke Focus coil |

## TRANSFORMER (AUDIO OUTPUT)

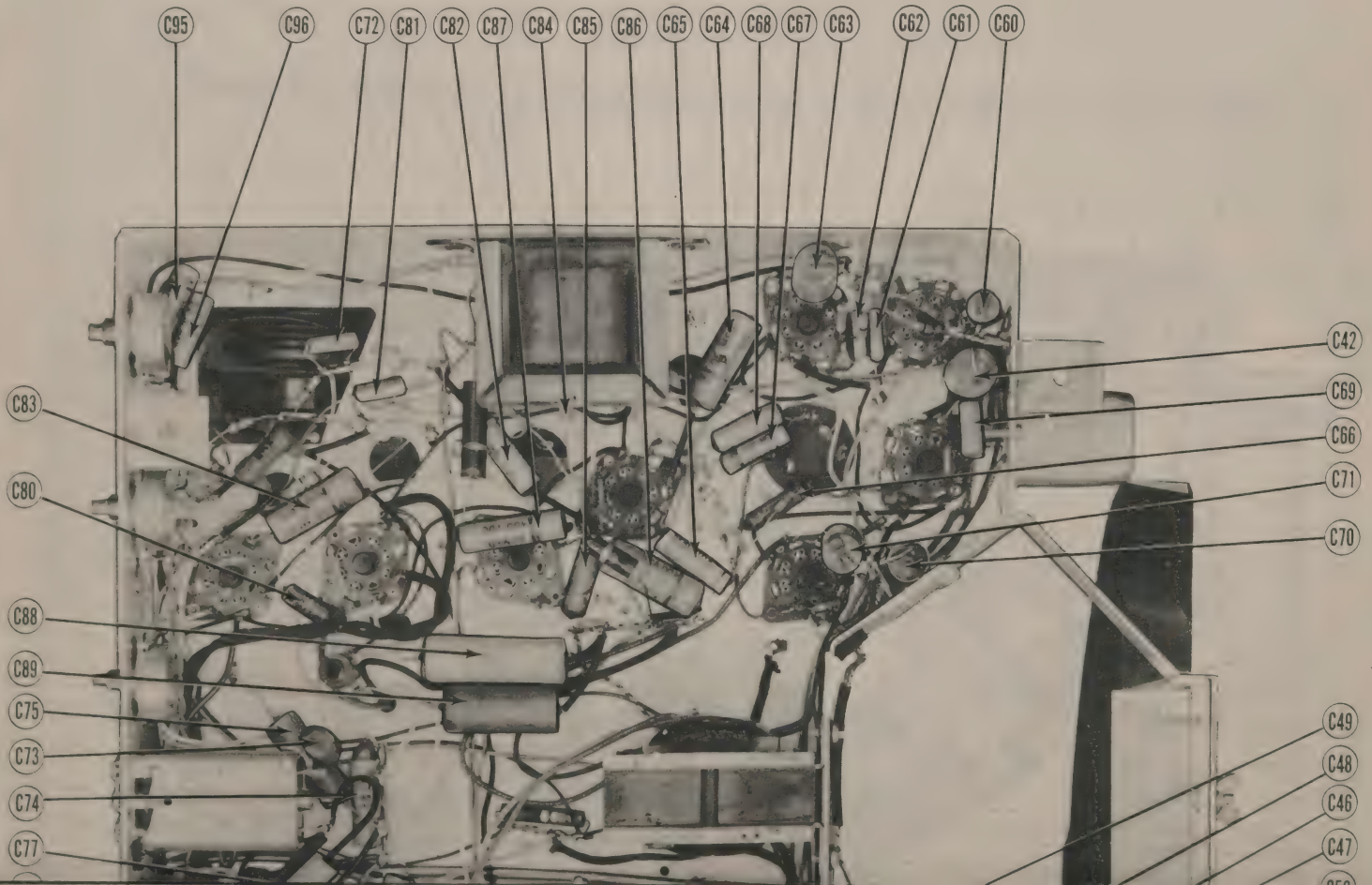
| ITEM No. | RATING IMPEDANCE PRI. | RATING IMPEDANCE SEC. | RATING DC RES. PRI. | RATING DC RES. SEC. | REPLACEMENT DATA HOFFMAN PART No. | REPLACEMENT DATA STANCOR PART No. | REPLACEMENT DATA CHICAGO PART No. | REPLACEMENT DATA MERIT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| T6 | 6000Ω | 3.8Ω | 450Ω Tap @ 210Ω | .4Ω | T5104 | | RO-9 | A-2935 | |

## MISCELLANEOUS

| ITEM No. | PART NAME | HOFFMAN PART No. | NOTES |
|---|---|---|---|
| [illegible] | Tuner Assembly RF-3 | [illegible] | |
| [illegible] | Tuner Assembly RF-1 | T5[illegible] | |
| [illegible] | Fuse | T-[illegible] | Type 3AF, 1/4 Amp. |
| [illegible] | Socket | [illegible] | AC Interlock |
| [illegible] | Ion Trap | | |




CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION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# HORIZONTAL OSC. ALIGNMENT

HORIZONTAL OSCILLATOR ALIGNMENT CHECK:

While receiving a television signal turn the horizontal hold control fully counter-clockwise. Remove the picture momentarily by turning the contrast control fully counter-clockwise and then return it to its normal operating position. The picture should pull back into synchronization.

Now turn the horizontal hold control fully clockwise. Remove the picture momentarily by turning the contrast control fully counter-clockwise and then return to its normal operating position. The picture should pull back into synchronization.

If receiver synchronizes properly under these checks it is not necessary to align the horizontal oscillator. However, if the picture is not normal or stable, the horizontal oscillator must be aligned.

SLIGHT RETOUCH ALIGNMENT

If the receiver failed in the above check at either extreme of the hold control, it may be possible to align the horizontal oscillator by making slight adjustments.

Tune in a TV station and adjust fine tuning for best sound quality. Adjust vertical hold control to vertically synchronize the picture. Adjust the contrast control to slightly less than normal. Turn the horizontal hold control to the extreme position in which the oscillator fails out of synchronization. Momentarily remove the signal. Adjust B2 (rear of chassis) until the oscillator pulls into synchronization. Check hold and pull-in as outlined above.

COMPLETE ALIGNMENT

Tune a TV station for the best sound quality. Adjust vertical hold control to vertically synchronized the picture. Adjust the contrast control to slightly less than normal.

Adjust B1 until the blanking bar, which may appear in the picture, moves to the right and off the raster. If ripples occur in the raster, turn B1 in a clockwise direction until the unstable condition is removed. The length of this adjustment screw in its correct position is usually about 1/2 inch beyond the bushing.

Turn horizontal hold control fully counter-clockwise and adjust B2 clockwise until picture fails to synchronize. Now siowly turn B2 counter-clockwise to the point where the picture synchronizes. Readjust B1 so that the left side of the picture is close to the left side of the raster but does not fold over.

Turn the horizontal hold control fully clockwise. The right side of the picture should be close to the right side of the raster, but should not fold over. If it does, readjust B1.

Momentarily remove the signal. When signal is restored, the picture should fall into synchronization. If it does not, turn B2 counter-clockwise until picture falls into synchronization.

Turn the horizontal hold control fully counter-clockwise. Picture should fall back into synchronization after momentary removal of the signal.

If picture fails to synchronize after momentary removal of the signal at both extremes of the horizontal hold control, there may be insufficient pull-in range. However, if picture will pull in through 3/4 of the hold control range, operation should be satisfactory as excessive pull-in is objectionable. Excessive pull-in makes the control circuits more sensitive which may result in their being triggered by noise pulses. Also the vertical synchronizing and equalizing pulses may cause a bend in the upper part of the picture.

# LINEARITY ADJUSTMENTS

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS

Adjust the HEIGHT control until picture fills mask vertically (6 3/8 inches.) Adjust VERTICAL LINEARITY for best linearity top to bottom. Readjust the HEIGHT control for proper height. The two controls are interacting and adjustment of one will require readjustment of the other. Adjust vertical centering to center picture vertically.

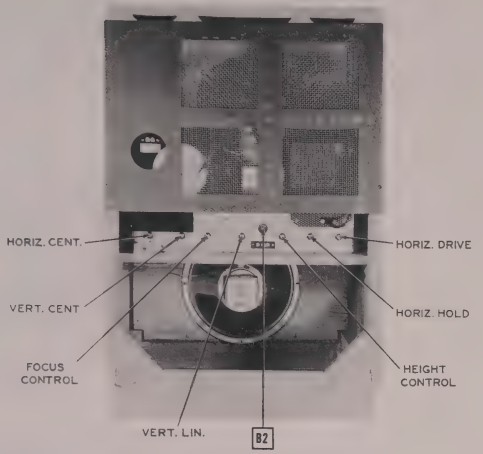
WIDTH AND HORIZONTAL LINEARITY ADJUSTMENTS

Turn the horizontal drive control clockwise as far as possible without crowding the right side of picture. This provides maximum voltage tube second anode. Adjust width control until raster fills the mask horizontally (8 1/2 inches). Adjust the horizontal linearity control until picture is symmetrical left to right. ( It may be necessary to slightly readjust the horizontal drive control). Adjust the horizontal centering control to center picture horizontally.

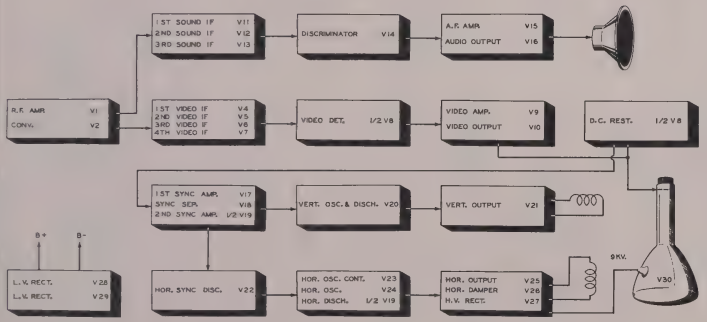
If continued adjustments of the drive , width and linearity controls fail to give proper linearity, it may be necessary to move the tap on R125 which is located in the high voltage compartment. After this tap is moved, it will be necessary to readjust the drive, width and linearity controls.

# DISASSEMBLY INSTRUCTIONS

1. Remove four push-on and three set screw type control knobs.
2. Remove five screws holding back cover. Remove back cover.
3. Disconnect speaker leads at solderless connectors.
4. Remove wood screws holding block at rear of chassis.
5. Loosen wing nuts holding picture tube at front of tube.
6. Remove four machine screws holding chassis. Remove chassis.

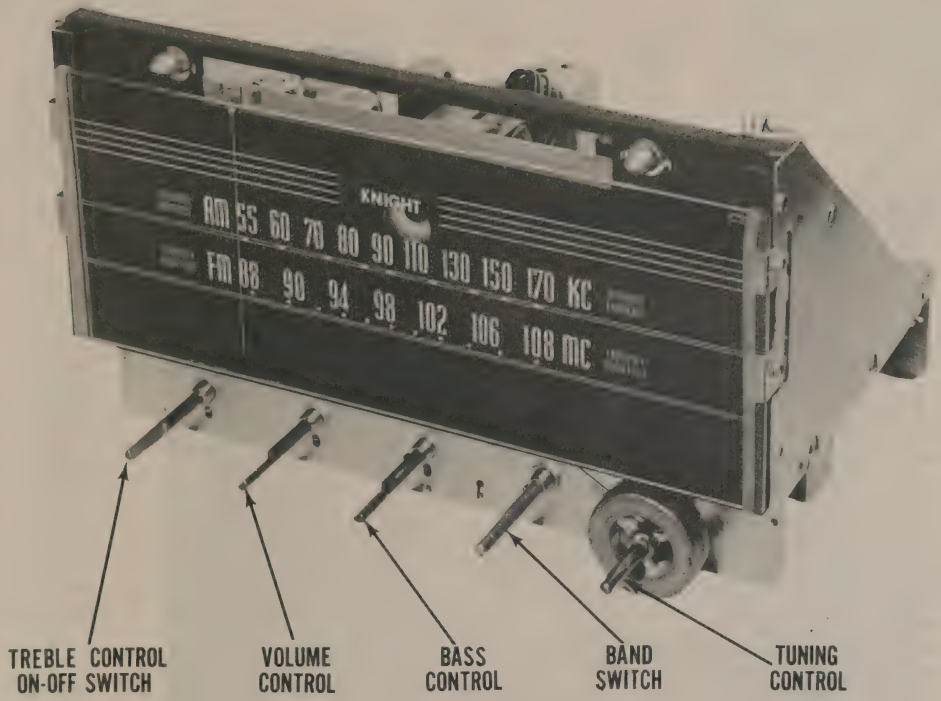



CABINET-REAR VIEW




BLOCK DIAGRAM

KNIGHT MODELS
14F490, 14F495, 14F496


KNIGHT
AM 55 60 70 80 90 110 130 150 170 KC
FM 88 90 94 98 102 106 108 mc
TREBLE CONTROL ON-OFF SWITCH
VOLUME CONTROL
BASS CONTROL
BAND SWITCH
TUNING CONTROL

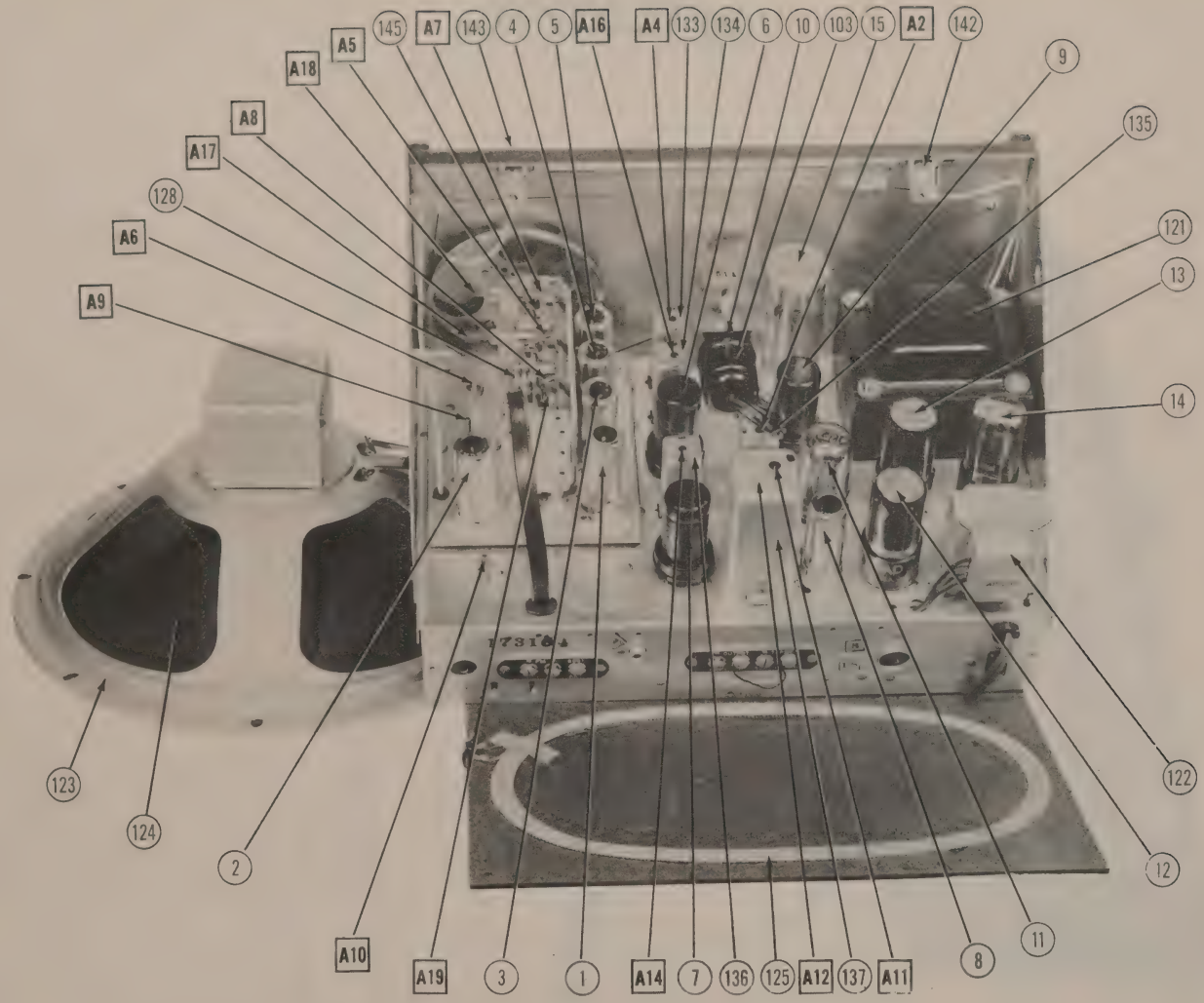
KNIGHT MODELS
14F490, 14F495, 14F496

KNIGHT MODEL 14F-495

| | |
|---|---|
| TRADE NAME | Knight, Models 14F-490, 14F-495, 14F-496 |
| SUPPLIER | Allied Radio Corp., 833 W. Jackson Blvd., Chicago 7, Illinois |
| TYPE SET | AC Operated AM-FM Superheterodyne Receiver with Loop Antenna |
| TUBES(FOURTEEN) | Types 6BA6 FM RF Amp., 6BA6 AM RF Amp., 6C4 FM Osc., 6BE6 FM Mixer, 6BE6 AM Converter, 6SG7 1st IF Amp., 6SH7 FM 2nd IF, 6AL5 FM Detector, 6SQ7 DET.-AVC-AF, 6U5/6G5 Tuning Indicator, 7F7 AF-Phase Inverter, (2) 6V6GT Power Output, 5Y3GT Rectifier. |
| POWER SUPPLY | 105-125 Volts AC — RATING .88 Amp., @ 117 Volts AC |
| TUNING RANGE-BROADCAST | 535-1720KC — FREQ. MOD. 88-108MC |

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1949 by Howard W. Sams & Co., Inc., Indianapolis Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America


145
A7
143
4
5
A16
A4
133
134
6
10
103
15
A2
142
A5
A18
A8
A17
128
A6
A9
9
135
121
13
14
122
12
11
8
123
124
2
A10
A19
3
1
A14
7
136
125
A12
137
A11

A
B
C
D
A1
A13
A15
A3

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| 1 | RF Amp. | | | 7GR | |
| 2 | RF Amp. | 6BA6 | 6BA6 | 7GR | |
| 3 | | 6C4 | 6C4 | 9AG | |
| 4 | | | | 7GR | |
| 5 | | | | 7GR | |
| 6 | | 6BE6 | 6BE6 | 9GK | |
| 7 | | 6SG7 | 6SG7 | 9GK | |
| 8 | | 6SH7 | 6SH7 | 9GK | |
| 9 | | 6AL5 | 6AL5 | 6AT | |
| 10 | | 6SQ7 | 6SQ7 | 7AG | |
| 11 | | | | 6R | |
| 12 | | | | 9AC | |
| 13 | | | | 7AG | |
| 14 | | | | 7GR | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: KNIGHT PART No. | REPLACEMENT DATA: AEROVOX PART No. | REPLACEMENT DATA: CORNELL-DUBILIER PART No. | REPLACEMENT DATA: ERIE PART No. | REPLACEMENT DATA: SOLAR PART No. | REPLACEMENT DATA: SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| 15A | 40 | 450 | N25.205 | AF862J4A* | UP4445 | | DY-2x10-450 | EL-240 | ▲ Filter |
| B | 40 | 450 | | | BR1045 | | M-10-450 | UT-12 | ■ Filter<br>▲ Filter |
| C | 10 | 450 | | | | | | | |
| 16 | 5 | 250 | N25.206 | PRS250/4 | BR425 | | M-4-450 | UT-42 | Stabilizing cap. |
| 17 | 8 | 450 | | PR8450/8 | BR845 | | M-8-450 | UT-8 | Osc. Plate Decoupling |
| 18 | .05 | 400 | | [illegible] | GT4S5 | | MPH-4-05 | TM-15 | Line Filter |
| 19 | .05 | 400 | | P488-05 | GT4S5 | | ST-6-002 | TM-22 | Output Plate Bypass |
| 20 | .002 | 600 | | P688-002 | GT6D2 | | ST-6-002 | TM-22 | |
| 21 | .002 | 600 | | P688-002 | GT6D2 | | ST-4-05 | TM-15 | Audio Coupling |
| 22 | .05 | 400 | | P488-05 | GT4S5 | | ST-4-05 | TM-15 | |
| 23 | .05 | 400 | | P488-05 | GT4S5 | | ST-4-05 | TM-15 | |
| 24 | .01 | 600 | | P688-01 | GT6S1 | GP2-335-01 | ST-6-01 | TM-11 | |
| 25 | .05 | 200 | | P488-05 | GT2S5 | | ST-4-05 | TM-15 | |
| 26 | .05 | 200 | | P488-05 | GT2S5 | | ST-4-05 | TM-15 | |
| 27 | .005 | 600 | | P688-005 | GT6D5 | GP2M-005 | ST-6-005 | TM-25 | Tone Comp. |
| 28 | .02 | 200 | | P488-02 | GT2S2 | | ST-4-02 | TM-12 | |
| 29 | .05 | 400 | | P488-05 | GT4S5 | | ST-4-05 | TM-15 | RF Bypass Pwr. Supp. Note |
| 30 | .5 | 200 | | [illegible] | GT2S5 | | ST-2-5 | TC-5 | Bias Filter |
| 31 | .05 | 200 | | P488-05 | GT2S5 | | ST-4-05 | TM-15 | AVC Filter |
| 32 | .05 | 400 | | P488-05 | GT4S5 | | ST-4-05 | TM-15 | Conv. Screen Bypass |
| 33 | .05 | 400 | | P488-05 | GT4S5 | | ST-4-05 | TM-15 | RF Screen Bypass |
| 34 | .02 | 200 | | P488-02 | GT2S2 | | ST-4-02 | TM-12 | Cathode Bypass |
| 35 | 250 | 500 | | 1468-00025 | 5W5T25 | GP2K-250 | MO.5-325 | 1FM-325 | 1st AF Plate Bypass |
| 36 | 2000 | 300 | | 1467-002 | 1W5D2 | GP2M-002 | MW.5-22 | 1FM-22 | AVC Filter |
| 37 | 250 | 500 | | 1468-00025 | 5W5T25 | GP2K-250 | MO.5-325 | 1FM-325 | FM Det. Diode Load Cap. |
| 38 | 3000 | 300 | | 1467-003 | 1W5D3 | GP2M-003 | MW.5-23 | 1FM-23 | De-emphasis |
| 39 | 2000 | 300 | | 1467-002 | 1W5D2 | GP2M-002 | MW.5-22 | 1FM-22 | RF Byp. Power Supply |
| 40 | 2000 | 300 | | 1467-002 | 1W5D2 | GP2M-002 | MW.5-22 | 1FM-22 | 2nd IF Plate Decoup. |
| 41 | 5000 | 300 | | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | 2nd IF Screen Bypass |
| 42 | 5000 | 300 | | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | 2nd IF Cathode Bypass |
| 43 | 2000 | 300 | | 1467-002 | 1W5D2 | GP2M-002 | MW.5-22 | 1FM-22 | 2nd IF Grid Filter |
| 44A | 100 | 300 | Note 1 | 1468-0001 | 5W5T1 | GP1K-100 | MO.5-31 | 1FM-31 | RF Diode Filter |
| B | 100 | 300 | Note 1 | 1468-0001 | 5W5T1 | GP1K-100 | MO.5-31 | 1FM-31 | |
| 45 | 10000 | 300 | | 1467-01 | 1D3S1 | GP2-335-01 | MW.3-11 | 1FM-11 | 1st IF Screen Bypass |
| 46 | 10000 | 300 | | 1467-01 | 1D3S1 | GP2-335-01 | MW.3-11 | 1FM-11 | 1st IF Cathode Bypass |
| 47 | 2000 | 300 | | 1467-002 | 1W5D2 | GP2M-002 | MW.5-22 | 1FM-22 | RF Byp. Power Supply |
| 48 | 2000 | 300 | | 1467-002 | 1W5D2 | GP2M-002 | MW.5-22 | 1FM-22 | Mixer Plate Decoup. |
| 49 | 100 | 500 | | 1468-0001 | 5W5T1 | GP1K-100 | MO.5-31 | 1FM-31 | Osc. Grid Cap. |
| 50 | 15 | 300 | | | | GP1K-15 | | MS-415 | Fixed Trimmer |
| 51 | 5 | 300 | | 1469-000005 | 5R5V5 | NP0K-5 | MOS.5-55 | MS-55 | |
| 52 | 1500 | 300 | | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | Osc. Plate Feedback |
| 53 | 40 | 500 | | 1468-00004 | 5W5Q4 | GP1K-50 | MO.5-44 | 1FM-44 | Osc. Grid Cap. |
| 54 | 2 | 300 | | | | GP2K-3 | | | Mixer Grid Cap. |
| 55 | 20 | 300 | N25.220 | | 5R5Q2 | NP0K-20 | MOS.5-42 | MS-42 | Fixed Trimmer Note |
| 56 | 20 | 300 | | | 5W5Q2 | NP0K-20 | MOS.5-42 | MS-42 | Osc. Feedback Note |
| 57 | 1500 | 300 | | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | Mixer Screen Bypass |
| 58 | 1000 | 300 | | 1467-001 | 1W5D1 | GP2L-001 | MW.5-21 | 1FM-21 | Mixer Cathode Bypass |
| 59 | 40 | 500 | | 1468-00004 | 5W5Q4 | GP1K-50 | MO.5-44 | 1FM-44 | RF Coupling |

# PARTS LIST AND DESCRIPTIONS (Continued)

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: KNIGHT PART No. | REPLACEMENT DATA: IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| 111 | [illegible] | ½ | | BTS-470K | Phase Inv. Grid |
| 112 | 1 [illegible] | ½ | | BTS-100K | Phase Inv. Cathode |
| 113 | 1 [illegible] | ½ | | BTS-100K | Phase Inv. Plate Load |
| 114 | [illegible] | ½ | | [illegible] | Output Grid |
| 115 | [illegible] | ½ | | [illegible] | " " |
| 116 | [illegible] | 2 | | BW-2-220 | Output Cathode |
| 117 | 470KΩ | ½ | | BTS-470K | Bias |
| 118 | 100Ω | ½ | | BW-½-100 | Feedback |
| 119 | 47KΩ | ½ | | BTS-47K | Decoupling |
| 120 | 1000Ω | 15 | N14.087 | DG-1000 | Filter |

Note 1. Items 90,44A & B are combined into one unit.

## TRANSFORMER (POWER)

| ITEM No. | RATING: PRI. | RATING: SEC. 1 | RATING: SEC. 2 | RATING: SEC. 3 | REPLACEMENT DATA: KNIGHT PART No. | REPLACEMENT DATA: STANCOR PART No. | REPLACEMENT DATA: CHICAGO PART No. | REPLACEMENT DATA: MERIT PART No. |
|---|---|---|---|---|---|---|---|---|
| 121 | 117VAC @ .88A | 600VCT @ .13ADC | 5.2VAC @ 2.0A | 6.5VAC @ 4.2A | B18.076 | P-6013 # | PH-120 | P-2063 # |

# Add series resistor to reduce plate voltage.

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING: IMPEDANCE PRI. | RATING: IMPEDANCE SEC. | RATING: DC RES. PRI. | RATING: DC RES. SEC. | REPLACEMENT DATA: KNIGHT PART No. | REPLACEMENT DATA: STANCOR PART No. | REPLACEMENT DATA: CHICAGO PART No. | REPLACEMENT DATA: MERIT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| 122A | 10KΩ CT | 500Ω 7.5Ω 4Ω | 440Ω CT | .6Ω | A15.038 | A-3804† | RO-303 | A-2904 | † Drill new mounting holes. |
| B | | | | | A15.036 | | | | |

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA: KNIGHT PART No. | REPLACEMENT DATA: JENSEN PART No. | REPLACEMENT DATA: QUAM PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | FIELD | V. C. IMP. | | ST-102 | | |
| 123 | PM | 7.5Ω | N11.072 | MOD.P12-S | 12A6 | |
| | CONE DIA. | V. C. DIA. | | | | |
| 124 | 11 1/2" | 1 1/4" | | | | |

## R F COILS

| ITEM No. | USE | DC RES. PRI. | DC RES. SEC. | REPLACEMENT DATA: KNIGHT PART No. | REPLACEMENT DATA: MEISSNER PART No. |
|---|---|---|---|---|---|
| 125 | AM Loop Ant. | | .8Ω | C5.027 | |
| 126 | AM Ant.Load | | 2Ω | B2.423 | |
| 127 | FM Dipole Ant. | | 0Ω | A5.010 | |
| 128 | FM Ant. | | 0Ω | N2.411 | |
| 129 | RF Coil | 90Ω | 3.4Ω | B2.409 | |
| 130 | FM RF Coil | | 0Ω | N2.412 | |
| 131 | AM Osc. | 3Ω | 7Ω | A2.410 | 14-1060 |
| 132 | FM Osc. | | 0Ω | N2.413 | |
| 133 | AM 1st IF | 10Ω | 10Ω | N2.414 | 16-6678 |
| 134 | FM 1st IF | 1Ω | 1Ω | N2.415 | |
| 135 | AM 2nd IF | 10Ω | 10Ω | N2.414 | 16-6678 |
| 136 | FM 2nd IF | 1Ω | 1Ω | N2.415 | |
| 137 | Ratio Det. | 1Ω | .5Ω | C2.278 | |
| 138 | RF Plate Chk | | 1.5Ω | A2.402 | |
| 139 | Fil. Choke | | .5Ω | N2.416 | |
| 140 | Fil. Choke | | .5Ω | N2.416 | |
| 141 | Fil. Choke | | .5Ω | N2.439 | |

# PARTS LIST AND DESCRIPTIONS (Continued)

| ITEM No. | RATING CAP. | RATING VOLT | REPLACEMENT DATA KNIGHT PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| 60A | 1500 | 300 | NOS.211 | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | RF Screen Bypass |
| B | 1500 | 300 | | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | Cathode Bypass |
| C | 1500 | 300 | | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | RF Byp. Power Supply |
| 61 | 1500 | 300 | | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | RF Coupling |
| 62 | 500 | 300 | | 1468-0005 | 5W5T5 | GP2K-500 | MO.5-35 | 1FM-35 | " |
| 63 | 1500 | 300 | | 1467-0015 | 1W5D15 | GP2L-0015 | MW.5-215 | 1FM-215 | AVC Filter |
| 64 | 5000 | 300 | | 1467-0025 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | Filament Bypass |
| 65 | 500 | 300 | | 1468-0005 | 5W5T5 | GP2K-500 | MO.5-35 | 1FM-35 | " |
| 66 | 500 | 300 | | 1468-0005 | 5W5T5 | GP2K-500 | MO.5-35 | 1FM-35 | " " |
| 67 | 500 | 300 | | 1468-0005 | 5W5T5 | GP2K-500 | MO.5-35 | 1FM-35 | " " |
| 68 | 250 | 500 | | 1469-00025 | 5W5T25 | GP2K-250 | MO.5-325 | 1FM-325 | Tone Comp. |

* Omit bypass section.
Note. Not used in all models.
Note 1. Item 44A, 44B and 90 are combined into one unit.

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA KNIGHT PART No. | IRC PART No. | CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| 69A | 500KΩ | ½ | A8.127 | D13-138X | T-78 | Volume control |
| B | Shaft | | Not Req. | A | Not Req. | Attach to 69A Per Instructions |
| 70A | 1 Meg. | ½ | A8.129 | D11-137 | M-61-S | Bass control |
| B | Shaft | | Not Req. | A | Not Req. | Attach to 70A Per Instructions |
| 71A | 1 Meg. | ½ | A8.126 | D13-137 | M-63-Z | Treble control |
| B | Shaft | | Not Req. | A | Not Req. | Attach to 71A Per Instructions |
| C | Switch | | Not Req. | 41 | SW-A | Attach to 71A Per Instructions |

## RESISTORS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA KNIGHT PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| 72 | 1000Ω | ½ | | BTS-1000 | Ant. Loading |
| 73 | 470KΩ | ½ | | BTS-470K | AM RF Grid |
| 74 | 100Ω | ½ | | | AM RF Cathode |
| 75 | 22KΩ | ½ | | BTS-22K | AM RF Screen |
| 76 | 150Ω | ½ | | | Parasitic Supp. |
| 77 | 22KΩ | ½ | | BTS-22K | AM Osc. Grid |
| 78 | 15KΩ | 2 | | BT-2-15K | AM Conv. Screen |
| 79 | 68Ω | ½ | | | FM RF Cathode |
| 80 | 470KΩ | ½ | | BTS-470K | FM RF Grid |
| 81 | 22KΩ | ½ | | BTS-22K | FM RF Screen |
| 82 | 47KΩ | ½ | | BTS-47K | FM Osc. Grid |
| 83 | 1000Ω | ½ | | BTS-1000 | FM Osc. Plate Decoupling |
| 84 | 22KΩ | ½ | | BTS-22K | FM Mixer Injector Grid |
| 85 | 150Ω | ½ | | | FM Mixer Cathode |
| 86 | 15KΩ | 2 | | BT-2-15K | FM Mixer Screen |
| 87 | 1000Ω | ½ | | BTS-1000 | FM Mixer Plate Decoupling |
| 88 | 68Ω | ½ | | | 1st IF Cathode |
| 89 | 2000Ω | ½ | | BTS-2200 | 1st IF Decoupling |
| 90 | 50KΩ | ½ | Note | BTS-47K | Diode Filter |
| 91 | 470KΩ | ½ | | BTS-470K | Diode Load |
| 92 | 220KΩ | ½ | | BTS-220K | 2nd IF Grid |
| 93 | 68Ω | ½ | | | 2nd IF Cathode |
| 94 | 22KΩ | 1 | | BTA-22K | 2nd IF Screen |
| 95 | 1000Ω | ½ | | BTS-1000 | 2nd IF Plate Decoupling |
| 96 | 470KΩ | ½ | | BTS-470K | AVC Net. |
| 97 | 22KΩ | ½ | | BTS-22K | De-emphasis |
| 98 | 10KΩ | ½ | | BTS-10K | Ratio Det. Diode Load |
| 99 | 10KΩ | ½ | | BTS-10K | " " " |
| 100 | 220KΩ | ½ | | BTS-220K | AVC Net. |
| 101 | 2 Meg. | ½ | | BTS-2.2 Meg. | " " |
| 102 | 2 Meg. | ½ | | BTS-2.2 Meg. | " " |
| 103 | 1 Meg. | ½ | | BTS-1 Meg. | Tuning Ind. Plate Load |
| 104 | 10KΩ | ½ | | BTS-10K | Tone Comp. |
| 105 | 10 Meg. | ½ | | BTS-10 Meg. | 1st AF Grid |
| 106 | 220KΩ | ½ | | BTS-220K | 1st AF Plate |
| 107 | 220KΩ | ½ | | BTS-220K | 2nd AF Grid |
| 108 | 2000Ω | ½ | | BTS-2200 | 2nd AF Cathode |
| 109 | 10Ω | ½ | | BW-½-10 | 2nd AF Cathode |
| 110 | 220KΩ | ½ | | BTS-220K | 2nd AF Plate Load |

DATE 9/6/6 491-12 SCH #93 FOLDER 12

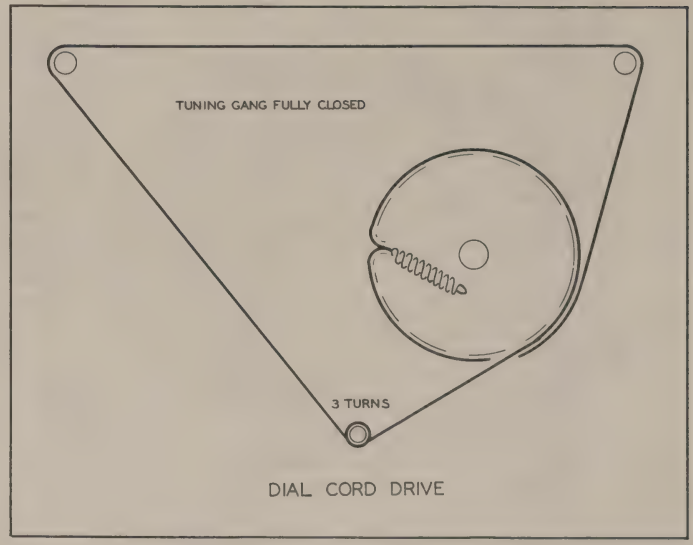
# PARTS LIST AND DESCRIPTIONS (Continued)

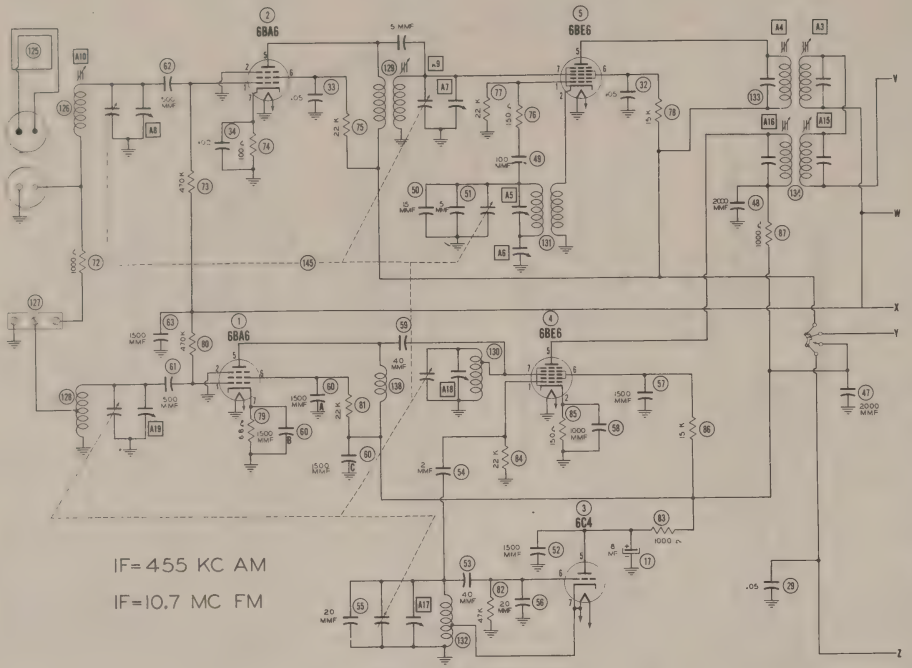
## DIAL LIGHTS

| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA KNIGHT PART No. | | NOTES |
|---|---|---|---|---|---|---|---|
| 142 | Bayonet | 6-8V | 0.15A | Brown | I12301 | | Type #47 |
| 143 | Bayonet | 6-8V | 0.15A | Brown | I12301 | | Type #47 |

## MISCELLANEOUS

| ITEM No. | PART NAME | KNIGHT PART No. | NOTES |
|---|---|---|---|
| 144 | Switch | A12.102 | Band-Phono |
| 145 | 3 Gang Var. Cap. | B6.070 | (40-537MF, 40-538MF, 24-517MF) |






VOLTAGE AND RESISTANCE READINGS TAKEN IN BROADCAST POSITION

VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | | 6.5VAC | 0V | | 21.5VDC | 100VDC | 1.1VDC | |
| 2 | | | | | | 225VDC | 135VDC | 1.4VDC | |
| 3 | | | | | | 195VDC | 6.3VDC | 0V | |
| 4 | | | | | | 205VDC | 90VDC | 0V | |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | 7.5VDC | |
| 9 | | | | | | | | 6.5VAC | 0V |
| 10 | | | | | | | | | |
| 11 | | | | | | | | | |
| 12 | | | | | | | | | |
| 13 | | | | | | | | | |
| 14 | | | 260VDC | 0V | 300VAC | 0V | 300VAC | 0V | 260VDC |

TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | |
| 2 | | | | | | | | | |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | | | | | | | |
| 11 | | | | | | | | | |
| 12 | | | | | | | | | |
| 13 | | | | | | | | | |
| 14 | | | | | | | | | |

† VOLTAGE AND RESISTANCE READINGS TAKEN IN FM POSITION.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.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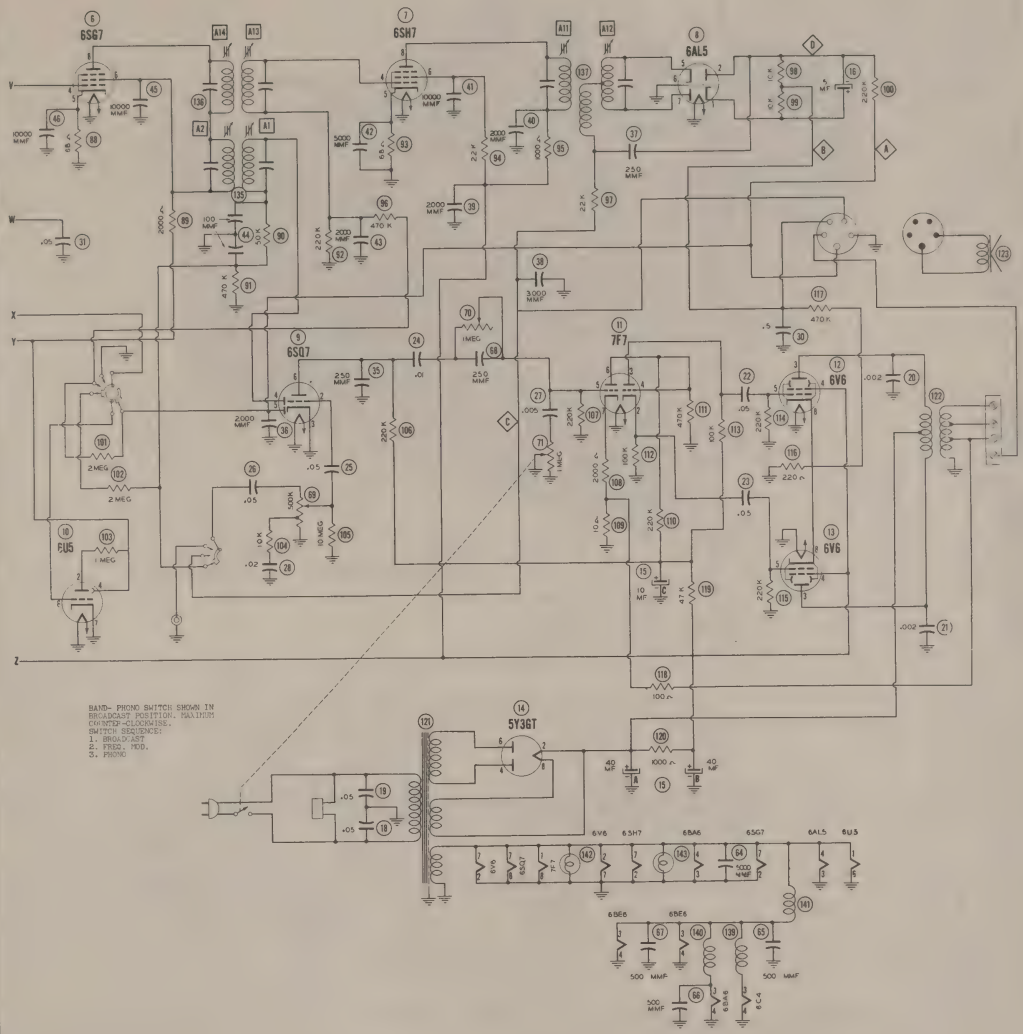


A PHOTOFACT STANDARD NOTATION SCHEMATIC

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## ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer to last reference mark at low frequency end of dial.
Attenuate output of signal generator to maintain output level of .5 watt.

## AM ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1. | .[illegible] | High side to pin 4 (Grid) of 6BQ7. Low side to chassis. | 455KC | AM (clock-wise) | Tuning cap fully open | Across voice coil | A1, A2 | Adjust for maximum output. |
| 2. | .[illegible] | High side to front AM stator of tuning cap. Low side to chassis. | " | " | " | " | A3, A4 | " " " " |
| 3. | .[illegible] | High side to external AM Ant. terminal. Low side to chassis. | 1720KC | " | " | " | A5 | " " " " |
| 4. | .[illegible] | " | 538KC | " | Tuning cap fully closed | " | A6 | Adjust for maximum output. Repeat steps 3 & 4 until no further improvement can be made. |
| 5. | .[illegible] | " | 1500KC | " | Tune for maximum output. | " | A7, A8 | Adjust for maximum output. |
| 6. | .[illegible] | " | 600KC | " | " | " | A9, A10 | Adjust for maximum output. Repeat steps 5 & 6 until no further improvement can be made. |

## FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM & OUTPUT METER

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 7. | .01MFD | High side to pin 4 (Grid) of 6SH7. Low side to chassis. | 10.7MC (Unmod.) | FM (center pos.) | Tuning cap fully open | DC Probe to point ◇1 Common to point ◇2 | A11 | Adjust for maximum deflection. |
| 8. | .01MFD | " | " | " | " | DC Probe to point ◇2 Common to point ◇1 | A12 | Adjust for zero deflection. Tune signal generator for maximum deflection above and below 10.7MC and note reading on VTVM (opp. polarity). If these two readings are not equal, adjust A11 until they are Equal. |

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 9. | .01MFD | High side to pin 4 (Grid) of 6SG7. Low side to chassis. | 10.7MC (400~ mod. 30%) | " | " | Across voice coil | A13, A14 | Solder a 1000Ω carbon resistor across primary of ratio detector transformer (137). Adjust A13 and A14 for maximum output. |
| 10. | .[illegible] | High side to front FM stator of tuning cap. Low side to chassis. | " | " | " | " | A15, A16 | Adjust for maximum output. Remove 1000Ω shunting resistor. Continue with FM-RF Alignment in step 11. |

## FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | SCOPE CONNECT | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 7. | .01MFD | High side to pin 4 (Grid) of 6SG7. Low side to chassis. | 10.7MC (Freq. Mod. | FM | Tuning cap fully open | Vertical input to point ◇1 Ground to chassis. | A11, A13, A14 | Disconnect 5MFD cap (16) from point D. Adjust A11, A13 and A14 for maximum amplitude, symmetry, and coincidence of pattern per Fig. 1. |
| 8. | .01MFD | High side to pin 7 (Grid) of 6BE6 FM Mixer (4). Low side to chassis. | " | " | " | " | A15, A16 | Adjust for maximum amplitude, symmetry and coincidence of pattern per Fig. 1. Reconnect cap (16) to point D. |
| 9. | .01MFD | " | " | " | " | Vertical input to point ◇2 Ground to chassis. | A12 | Adjust for crossover of horizontal lines occurring at scope horizontal sweep line per Fig. 2. Continue with FM-RF Alignment in step 11. |

## FM RF ALIGNMENT

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 11. | 270Ω carbon res. | High side to FM Ant. terminal "A2". Low side to chassis. | 108.8MC (Unmod.) | FM | Tuning cap fully open | DC Probe to point ◇2 Common to chassis. | A17 | Adjust for maximum deflection. |
| 12. | 270Ω carbon res. | " | 97.5MC (Unmod.) | " | Tuning cap fully closed | " | FM Osc. Coil (132) | Expand or compress coil slightly for maximum deflection. Repeat steps 11 & 12 until no further improvement can be made. |
| 13. | 270Ω carbon res. | " | 108MC (Unmod.) | " | Tune for maximum deflection. | " | A18, A19 | Rock tuning cap and adjust for maximum deflection. |
| 14. | 270Ω carbon res. | " | 88MC (Unmod.) | " | " | " | FM RF Coil (130) and FM Ant. Coil (128) | Expand or compress coils slightly for maximum deflection. Repeat steps 11 and 12 until no further improvement can be made. |

FIG. 1

FIG. 2

MAGNAVOX
CHASSIS CR-199

MAGNAVOX CHASSIS CR-199

| | |
|---|---|
| **TRADE NAME** | Magnavox, Chassis CR-199 |
| **MANUFACTURER** | Magnavox Co., 2131 Bueter Rd., Fort Wayne, Indiana |
| **TYPE SET** | AC Operated Superheterodyne Receiver with Loop Antenna. |
| **TUBES** (Nine) | Types 6SK7 RF Amp., 6SA7 Converter, 6SK7 IF Amp., 6J5 Det.-AVC., 6J5 AF Amp., 6SN7GT Phase Inv., (2) 6V6GT Power Output, 5Y3GT Rectifier. |

**POWER SUPPLY** 110-120 Volts AC
**TUNING RANGE—BROADCAST** 534-1620KC RATING .92 Amp. @ 117 Volts AC

**ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT**

To set pointer turn tuning cap. fully closed and set pointer to last reference mark at low frequency end of dial.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1 | 250MMF | High Side Pin 8 (Grid) 12SA7 (V2). Low side to chassis. | 455KC | Tuning Cap. Fully closed. | Across voice coil | A1, A2, A3, A4 | Adjust for Maximum Output |
| 2 | 250MMF | High side to "Ant." terminal. (Ant.-Loop Switch in "Ant" position). Low side to chassis | 600KC | 600KC | Across voice coil | A5 | Rock Tuning Gang and adjust for maximum output. |
| 3 | 250MMF | " | 1400KC | 1400KC | " | A6, A7, A8 | Adjust for maximum output. Recheck 600KC Padder setting. |
| 4 | | Loop (Ant.-loop switch in "loop" position) | 1400KC | 1400KC | " | A9 | Install chassis in cabinet and fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust A9 for maximum output. |

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# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: MAGNAVOX PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| V1 | RF Amp. | 6SK7 | 6SK7 | 8N | |
| V2 | Converter | 6SA7 | 6SA7 | 8R | |
| V3 | IF Amp. | 6SK7 | 6SK7 | 8N | |
| V4 | Det.-AVC | 6J5 | 6J5 | 6Q | |
| V5 | AF Amp. | 6J5 | 6J5 | 6Q | |
| V6 | Phase Inverter | 6BN7GT | 6BN7GT | 9BD | |
| V7 | Power Output | 6V6GT | 6V6GT | 7AC | |
| V8 | Power Output | 6V6GT | 6V6GT | 7AC | |
| V9 | Rectifier | 5Y3GT | 5Y3GT | 5T | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

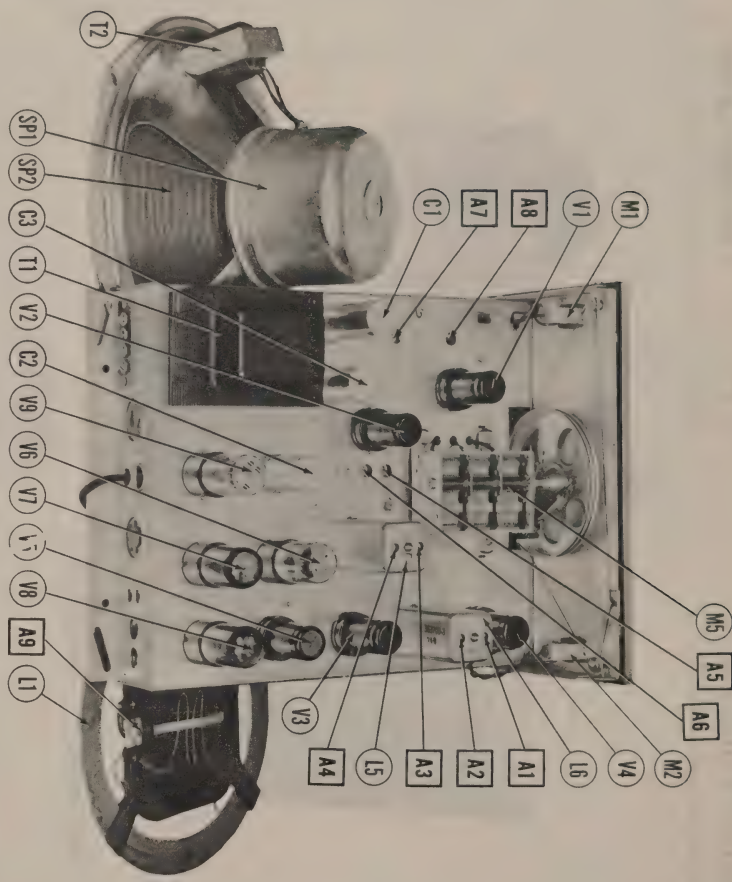
| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: MAGNAVOX PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | 30 | 475 | 27002302 | AF444J † | UP3145 | | DY-3x15-450 † | EL-344† | ■ Filter |
| C1B | 10 | 475 | | | | | | | ▲ Filter |
| C2A | 10 | 450 | 27002306 | AF22J4A* | UP1045C | | DY-10/450-25/50 | EL-202* | ■ Decoupling<br>▲ Output Cath. Bypass |
| C2B | 20 | 25 | | | | | | | |
| C3A | 10 | 450 | 27002306 | AF22J4A* | UP1045C | | DY-10/450-25/50 | EL-202* | ■ Decoupling<br>▲ Cathode Bypass |
| C3B | 20 | 25 | | | | | | | |
| C4 | 20 | 25 | 27002702 | FRS 25/25 | BR202A | | M-25-25 | TA-25 | AF Cathode Bypass |
| C5 | .01 | 200 | 25015201B | P488-01 | GT2S1 | GP2-335-01 | ST-4-01 | TM-11 | Ext. Ant. Isolation |
| C6 | .05 | 200 | 25015201S | P288-05 | GT2S5 | | ST-4-05 | TM-15 | AVC Filter |
| C7 | .05 | 200 | 25015201S | P288-05 | GT2S5 | | ST-4-05 | TM-15 | RF Cath. Bypass |
| C8 | .05 | 200 | 25015201S | P288-05 | GT2S5 | | ST-4-05 | TM-15 | AVC Filter |
| C9 | .05 | 200 | 25015201S | P288-05 | GT2S5 | | ST-4-05 | TM-15 | Conv. Cath. Bypass |
| C10 | 518 | 500 | 25008503S | | | | | | Fixed Padder ± 1% |
| C11 | .1 | 400 | 25015201З | P488-1 | GT4P1 | | ST-4-11 | TM-1 | Decoupling |
| C12 | .1 | 400 | 25015202З | P488-1 | GT4P1 | | ST-4-1 | TM-1 | Decoupling |
| C13 | .05 | 200 | 25015201S | P288-05 | GT2S5 | | ST-4-05 | TM-15 | IF Cath. Bypass |
| C14 | 220 | 500 | 25015901G0 | 1468-0002 | SW5T2 | GP2K-200 | MO.5-32 | 1FM-32 | Diode Filter |
| C15 | 100 | 500 | 25015909F | 1468-0001 | SW5T1 | GP1K-100 | MO.5-31 | 1FM-31 | Diode Filter |
| C16 | .01 | 200 | 25015201B | P488-01 | GT2S1 | GP2-335-01 | ST-4-01 | TM-11 | Audio Coupling |
| C17 | 8 | | 25016461 | 1468-00001 | SW5Q1 | GP1K-10 | MO.5-41 | MS-41 | Tone Comp. |
| C18 | 150 | 500 | 25015908Ч | 1469-00015 | SP5T15 | GP2K-150 | MOS.5-315 | 1FM-315 | Audio Coupling |
| C19 | .01 | 400 | 25015202Г | P488-01 | GT4S1 | GP2-335-01 | ST-4-01 | TM-11 | Tone Comp. |
| C20 | .005 | 600 | 25015Ш41 | P688-005 | GT6D5 | GP2M-005 | ST-6-005 | TM-25 | Audio Coupling |
| C21 | 220 | 500 | 25015901G0 | 1468-0002 | SW5T2 | GP2K-200 | MO.5-32 | 1FM-32 | Tone Comp. |
| C22 | 330 | 500 | 25015909B | 1468-0003 | SW5T3 | GP2K-300 | MO.5-33 | 1FM-33 | Tone Comp. |
| C23 | .015 | 200 | 25015Д270 | P288-015 | GT6S15 | | | | Tone Comp. |
| C24 | .1 | 400 | 25015202Д | P488-1 | GT4P1 | | ST-4-1 | TM-1 | Audio Coupling |
| C25 | .03 | 400 | 25012502S | P488-03 | GT4S3 | | ST-6-03 | TM-13 | Audio Coupling |
| C26 | 1800 | 500 | 25016006Г | | | | | | Tone Comp. |
| C27 | .02 | 200 | 25015201Г | P488-02 | GT2S2 | | ST-4-02 | TM-12 | Tone Comp. |
| C28 | .0015 | 600 | 25015204Ч | P688-0015 | GT6D2 | | ST-6-002 | TM-22 | Output Plate Bypass |
| C29 | .02 | 600 | 25012903 | P688-02 | GT6S2 | | ST-6-02 | TM-12 | Line Filter |
| C30 | .02 | 600 | 25012903 | P688-02 | GT6S2 | | ST-6-02 | TM-12 | Line Filter |
| C31 | .02 | 600 | 25012903 | P688-02 | GT6S2 | | ST-6-02 | TM-12 | Phono Motor Bypass |

* Omit One Section
† Parallel Sections To Obtain Desired Capacity.

## CONTROLS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: MAGNAVOX PART No. | IRC PART No. | CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| R1A | 1 Meg. | ½ | 22007401 | D18-137X | T-103 | Volume Control tapped at 100KΩ |
| R1B | Shaft | | Not Req. | A | Not Req. | Attach to R1A per instr. |
| R2 | 150KΩ | ½ | 22004506 | | | Bass Control |
| R3A | 500KΩ | ½ | 220044G22 | D13-133 | M-60-Z | Treble Control. |
| R3B | Shaft | | Not Req. | A | Not Req. | Attach to R3A per instr. |

# CHASSIS—TOP VIEW

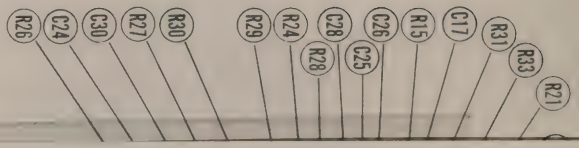


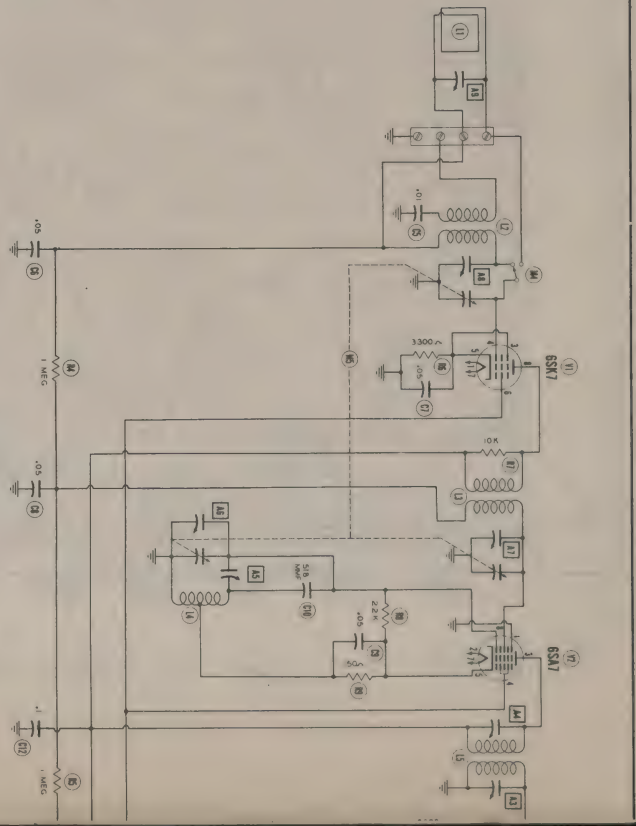
## PARTS LIST AND DESCRIPT ed)

### RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | MAGNAVOX PART No. | IRC PART No. | |
| R4 | 1 Meg. | ± ± ± ± ± | 230084G31 | BTS-1 Meg. | AVC Ne |
| R5 | 1 Meg. | | 230084G31 | BTS-1 Meg. | AVC Ne |
| R6 | 3300Ω | | 230084G16 | BTS-3300 | RF Cat |
| R7 | 10KΩ | | 230084G19 | BTS-10K | RF Coi |
| R8 | 22KΩ | | 230084G21 | BTS-22K | Osc. ( |
| R9 | 150Ω | | 230084G8 | BW-±-150 | Convex |
| R10 | 3300Ω | | 230084G16 | GTS-3300 | IF Ca |

## CHASSIS—BOTTOM VIEW




* PHOTOFACT STANDARD NOTATION SCHEMATIC

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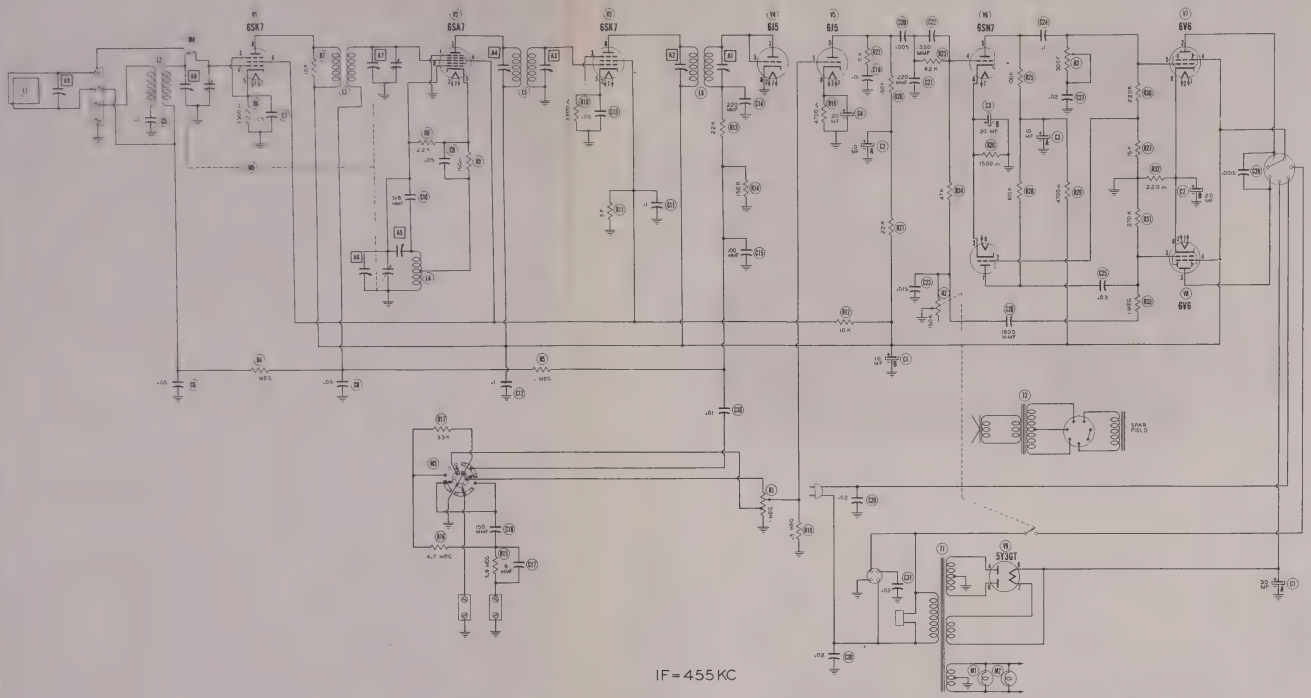
1. DC Voltage me
measured at I(
2. Socket connecti
3. Measured value
4. Line voltage m
5. Normal operat
6. ± 10% in volt
Volume contro
mens.

TAKEN WITH VACUUM TUBE VOLTMETER




VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| V 1 | 6SK7 | -1 | 77VDC | 77VDC | -1.1VDC | 0VDC | 110VDC | 2VAC | 2.7DC |
| V 2 | 6SA7 | 0V | 77VDC | 250VDC | 100VDC | 6±0.75VDC | 250VDC | 2VAC | -1.1VDC |
| V 3 | 6SK7 | 0V | 77VDC | -1.1VDC | 0V | 5.8VDC | 105VDC | 2VAC | 2.6VDC |
| V 4 | 6J5 | 0V | 77VDC | -2.2VDC | 0V | -1.1VDC | 0V | 77VAC | 0V |
| V 5 | 6J5 | 0V | 77VDC | +52VDC | 0V | 0V | 250VDC | 0VAC | 5.2VDC |
| V 6 | 6SN7GT | 0V | 11VDC | 64VDC | 0V | 11VDC | 4.4VDC | 2VAC | 2VAC |
| V 7 | 6V6GT | 0V | 2VAC | 270VDC | 260VDC | 0V | 245VDC | 2VAC | 16.5VDC |
| V 8 | 6V6GT | 0V | 2VAC | 270VDC | 260VDC | 0V | 270VDC | 2VAC | 16.5VDC |
| V 9 | 5Y3GT | 0V | 2VAC | 400VDC | 0V | 360VAC | 0V | 2VAC | 410VDC |

TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| V 1 | 6SK7 | 0Ω | 450 | 3.2M | 2.7Meg. | 3.3MΩ | 410K | 450 | 410ΩΩ |
| V 2 | 6SA7 | 0Ω | 450 | 410ΩΩ | 410K | 220Ω | 150Ω | 450 | 1.1 Meg. |
| V 3 | 6SK7 | 0Ω | 450 | 3.2MΩ | 220Ω | 3.3K | 410Meg | 2Ω | 410ΩΩ |
| V 4 | 6J5 | 0Ω | 450 | 150KΩ | Inf. | 150KΩ | Inf. | 2Ω | 0Ω |
| V 5 | 6J5 | 0Ω | 450 | 410ΩΩ | 1.4 Meg. | 410Ω | 410Ω | 2Ω | 4.7Ω |
| V 6 | 6SN7GT | 114Ω | 410ΩΩ | 1.5KΩ | 0ΩΩ | 11MΩ | 1.5KΩ | 2Ω | 2Ω |
| V 7 | 6V6GT | 0Ω | 450 | 410ΩΩ | 410K Ω | 220KΩ | 220KΩ | 2Ω | 220Ω |
| V 8 | 6V6GT | 0Ω | 450 | 410ΩΩ | 410ΩΩ | 270Ω | 220Ω | 2Ω | 220Ω |
| V 9 | 5Y3GT | Inf. | 450 | Inf. | 150Ω | Inf. | 150Ω | Inf. | 0ΩΩ |

*Measured from pin 8 of V9

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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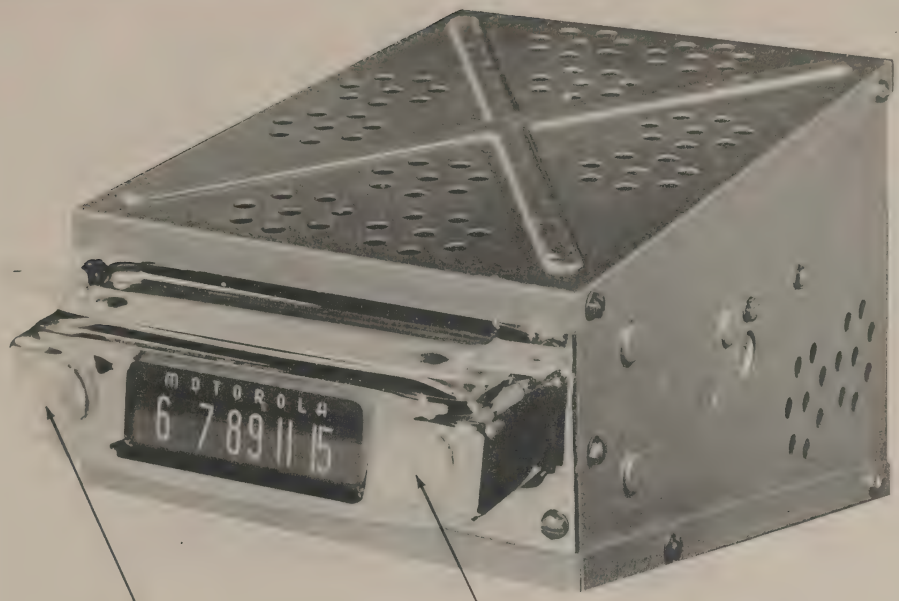
MOTOROLA
MODEL 309




MOTOROLA
MODEL 309

MOTOROLA MODEL 309

| | |
|---|---|
| **TRADE NAME** | Motorola, Model 309 |
| **MANUFACTURER** | Motorola, Inc.,4545 Augusta Blvd., Chicago 51, Illinois |
| **TYPE SET** | Battery Operated Universal Automotive Superheterodyne Receiver. |
| **TUBES** (Six) | Types 6SK7GT RF Amp., 6SA7GT Converter, 6SK7GT IF Amp., 6SQ7GT Det.-AVC-AF, 6V6GT Power Output, 6X5GT Rectifier. |

**POWER SUPPLY** 6 Volt Storage Battery
**TUNING RANGE—BROADCAST** 540 - 1600KC RATING 6.4 Amp. @ 6 Volts DC

**ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT**

The dummy antenna used in steps 2, 3, and 4 consists of a 60MMF capacitor in series with the "high" side lead of the signal generator which is shunted by a 30 MMF capacitor. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1 | .1MFD | High side to Pin 8 (grid)6SA7 (V2). Low side to chassis. | 455KC | High frequency end. | Across voice coil | A1, A2, A3, A4 | Adjust for maximum output. |
| 2 | See Pre-alignment instr. | To antenna connector through dummy. | 1605KC | High frequency end--cores should project 1¼" from cans. | Across voice coil | A5, A6, A7 | Adjust for maximum output. |
| 3 | " | " | 1300KC | Set coil cores 5/16" from their maximum travel point. | " | A8, A9, A10. | Adjust for maximum output. |
| 4 | " | " | 600KC | Tune for max. signal | " | | Turn pointer adjustment screw until pointer indicates 600KC. |

Install receiver in car and tune in weak station near 1400KC. Readjust A7 for maximum volume.

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# PARTS LIST AND DESCRIPTIONS

MOTOROLA MODEL 309

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: MOTOROLA PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| V1 | RF Amp. | | 6SK7GT | 6N | |
| V2 | Converter | | 6SA7GT | 6AD | |
| V3 | IF Amp. | | 6SK7GT | 6N | |
| V4 | Det.-AVC-AF | | 6SQ7GT | 6S | |
| V5 | Power Output | | 6V6GT | 7AC | |
| V6 | Rectifier | | 6X5GT | 6S | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: MOTOROLA PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | 15 | 350 | 23A485677 | AFH3H2H4A | UP15D35 | | DY-2x15-350 | EL-153 | ◻ Filter |
| C1B | 10 | 350 | | | BR202A | | M-25-25 | | ▲ Filter |
| C1C | 20 | 25 | | | | | | | Bias Filter |
| C2 | 200 | | 21K87136 | 1468-0001 | 5W5T2 | GP2K-200 | MO.5-32 | 1FM-32 | Fixed Trimmer |
| C3 | .006 | 100 | 8C4529 | P488-006 | GT6D6 | GP2-335-0075 | ST-6-006 | TM-26 | Ant. Isolation |
| C4 | .05 | 100 | 8K13514 | P288-05 | GT2S5 | | ST-4-05 | TM-15 | AVC Filter |
| C5 | .08 | 400 | 3K147-1 | P488-05 | GT4S5 | | ST-4-05 | TM-15 | RF Decoupling |
| C6 | 5 | | 23A4-1826 | 1468-00005 | 5W5V5 | NP0K-5 | MO.5-55 | MS-55 | RF Coupling |
| C7 | 50 | | 21K74661 | 1468-00005 | 5W5X5 | GP1K-50 | MO.5-45 | 1FM-45 | Osc.Grid Cap. |
| C8 | 250 | 500 | 21R0843 | 1468-00025 | 5W5T25 | GP2K-250 | MO.5-325 | 1FM-325 | Diode Filter |
| C9 | .01 | 100 | 8K472754 | P488-01 | GT2S1 | GP2-335-01 | ST-4-01 | TM-11 | Audio Coupling |
| C10 | .01 | 400 | 8K23690 | P488-01 | GT4S1 | GP2-335-01 | ST-4-01 | TM-11 | Audio Coupling |
| C11 | 250 | 500 | 21R6843 | 1468-00025 | 5W5T25 | GP2K-250 | MO.5-325 | 1FM-325 | RF Bypass |
| C12 | .004 | 400 | 9K71009 | P688-004 | GT6D4 | GP2M-005 | ST-6-004 | TM-24 | Output Plate Bypass |
| C13 | .006 | 1600 | 8K12540 | P1688-006 | GT16D6 | | STM16-006 | MB-26 | Buffer |
| C14 | .5 | 100 | 8K17028 | | | | SHH-1 | 68P20 | Hash Filter |
| C15 | .1 | 100 | 8K472035 | P288-1 | GT2P1 | | ST-2-1 | TM-1 | Hash Filter |

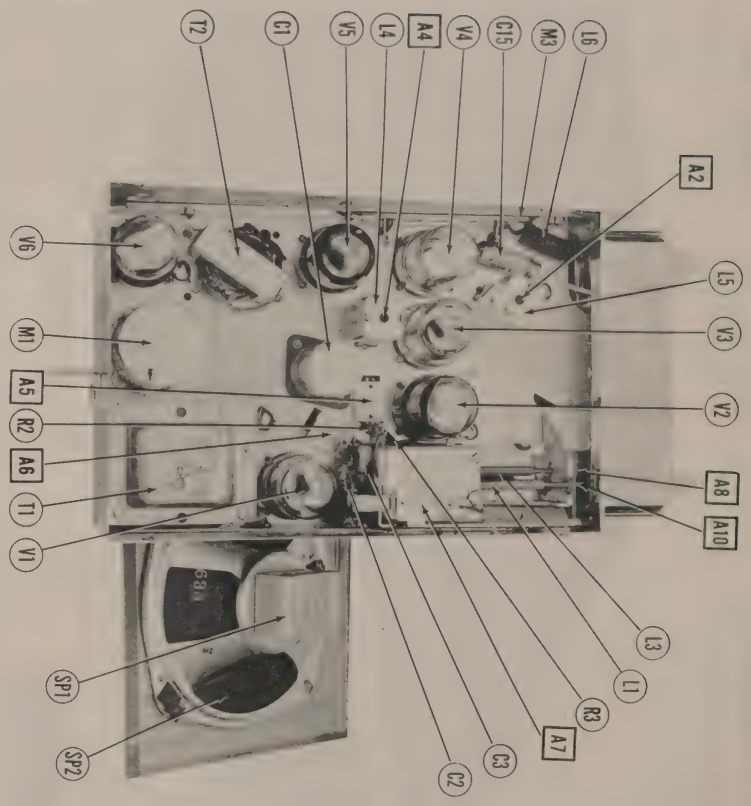
## CONTROLS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: MOTOROLA PART No. | REPLACEMENT DATA: IRC PART No. | REPLACEMENT DATA: CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| R1A | 500KΩ | ½ | 19A485612 | D13-133 | AM-60-Z | Volume Control. |
| B | Shaft | | Not Req. | B | KSS-3 | Attach to R1A per instructions |
| C | Switch | | " " | 41 | SW-A | " " " " " |

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: MOTOROLA PART No. | REPLACEMENT DATA: IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| R2 | 470KΩ | ½ | 6R6032 | BTS-470K | AVC Network |
| R3 | 100KΩ | ½ | 6R6075 | BTS-100K | Conv. Grid |
| R4 | 33KΩ | ½ | 6R6012 | BTS-33K | Osc. Grid |
| R5 | 3900Ω | 2 | 6R476012 | BT-2-3900 | Voltage Dropping |
| R6 | 1Meg. | ½ | 6R6004 | BTS-1MEG | AVC Network |
| R7 | 4.7MEG | ½ | 6R6122 | BTS-4.7MEG | AF.Grid |
| R8 | 470KΩ | ½ | 6R6032 | BTS-470K | AF Plate |
| R9 | 22Ω | ½ | 6R6406 | BW-½-22 | Voltage Divider |
| R10 | 180Ω | 1 | 6R6390 | BW-1-180 | Voltage Divider |
| R11 | 220KΩ | ½ | 6R6015 | BTS-220K | Output Grid |
| R12 | 1500Ω | 2 | 6R2005 | BT-2-1500 | Filter |
| R13 | 56Ω | ½ | 6R5614 | BW-½-56 | Hash Suppression |
| R14 | 56Ω | ½ | 6R5614 | BW-½-56 | Hash Suppression |

# CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (VIBRATOR)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | |
|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | SEC. 3 | MOTOROLA PART No. | STANCOR PART No. | CHICAGO PART No. | MERIT PART No. |
| T1 | 6VDC @5.4A | 540VCT @.065ADC | | | 250485630 | P-4061# | | P-4071 # |

*Drill New Mounting Holes.

## TRANSFORMER (OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | MOTOROLA PART No. | STANCOR PART No. | CHICAGO PART No. | MERIT PART No. | |
| | PRI. | SEC. | PRI. | SEC. | | | | | |
| T2 | 5.5KΩ | 3.2Ω | 340Ω | .6Ω | 25B70171 | A-3877 | RO-301 | A-2030 | |

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | | | MOTOROLA PART No. | JENSEN PART No. | QUAM PART No. | |
| | FIELD | V. C. Imp. | 50B580759 | | 52A1 | Alternate Part No. 50B590079 |
| SP1 | FM | 3.2Ω | | | | |
| | CONE DIA. | V. C. DIA. | | | | |
| SP2 | 5 1/8" | 7/16" | | | | |

## R F COILS

| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | |
|---|---|---|---|---|---|---|
| | | PRI. | SEC. | MOTOROLA PART No. | MEISSNER PART No. | |
| L1 | Ant. Coil | 1Ω | | 24B580570 | | L1, 2 and 3 are slug tuned in gang. |
| L2 | RF Coil | 1Ω | | 24K580571 | | |
| L3 | Osc.Coil | .8Ω | 3Ω | 24B580569 | | |
| L4 | Input IF | 10Ω | 17Ω | 24B485553 | 16-6663 | |
| L5 | Output IF | 17Ω | 17Ω | 24B485553 | 16-6669 | |
| L6 | RF Choke | .3Ω | | 24K5[illegible]706 | | |
| L7 | Hash Choke | .2Ω | | 24A472535 | | |

## VIBRATOR

| ITEM No. | TYPE | INPUT VOLTS | FREQUENCY | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|
| | | | | MOTOROLA PART No. | CORNELL-DUBILIER PART No. | RADIART PART No. | |
| M1 | Int. | 6 | 115~ | 4[illegible]B3333 | C42M | 5342M | |

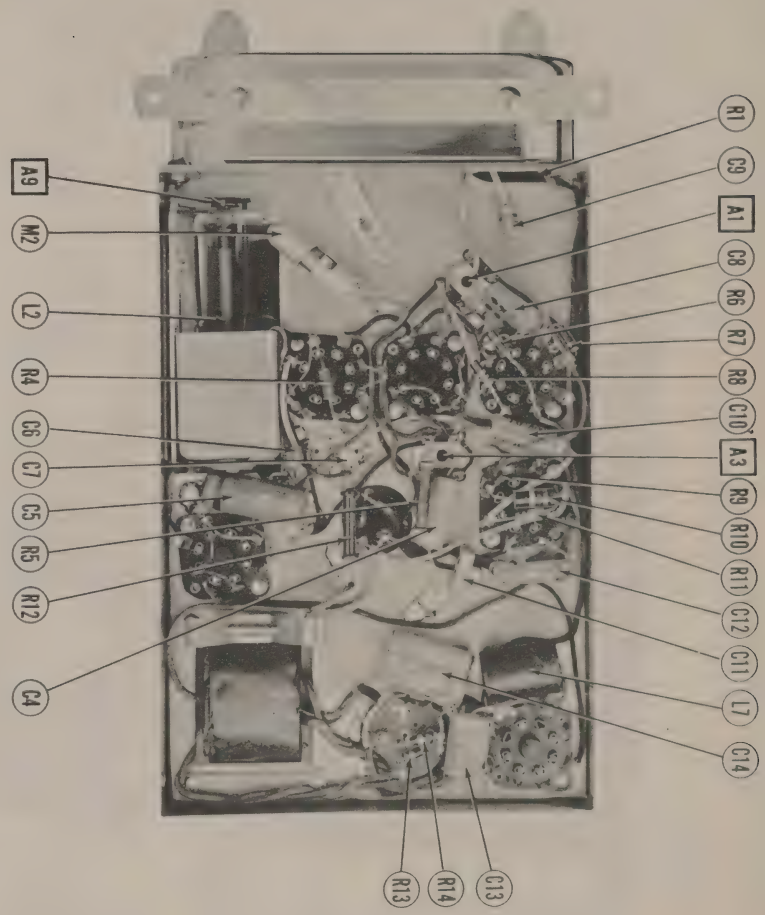
## DIAL LIGHTS

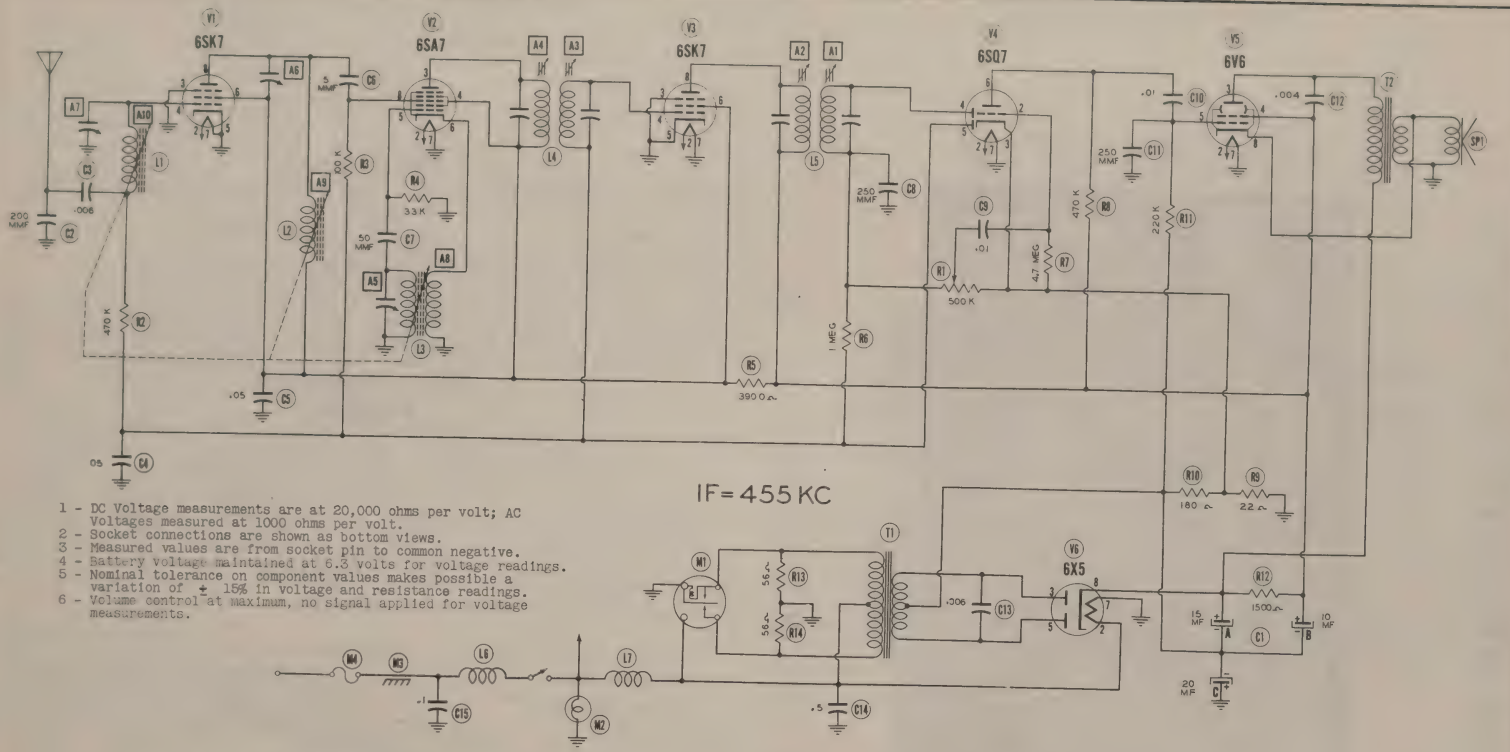
| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|---|
| | | | | | MOTOROLA PART No. | | |
| M2 | Bayonet | 6-8V | 0.25A | Blue | 8SX10867 | | Type #44 |

## MISCELLANEOUS

| ITEM No. | PART NAME | MOTOROLA PART No. | NOTES |
|---|---|---|---|
| M2 | Spark Plate | 1A4[illegible]C06 | |
| M4 | Fuse | 65A10286 | 10Amp. |
| A5 | Trimmer | 20A580113 | Osc. Adj. |
| A6 | Trimmer | 20A481526 | RF Adj. |
| A7 | Trimmer | 20A485652 | Ant. Adj. |
| | Dial Pointer | 1X580163 | Includes Drive Plate |
| | Knob | [illegible] | |
| | Dial Scale | [illegible] | Glass |

## CHASSIS—BOTTOM VIEW






1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Battery voltage maintained at 6.3 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| V 1 | 6SK7GT | 0V | 6VDC | 0V | -.6VDC | 0V | 90VDC | 0V | 91VDC |
| V 2 | 6SA7GT | 0V | 6VDC | 90VDC | 90VDC | -12VDC | 0V | 0V | -1.2VDC |
| V 3 | 6SK7GT | 0V | 0V | 0V | -1.8VDC | 0V | 90VDC | 6VDC | 185VDC |
| V 4 | 6SQ7GT | 0V | -2VDC | -1.6VDC | -1.7VDC | -1.8VDC | 80VDC | 0V | 6VDC |
| V 5 | 6V6GT | -1.2VDC | 0V | 0V | 185VDC | -10VDC | -1.3VDC | 0V | 0V |
| V 6 | 6X5GT | 0V | 6VDC | 6VDC | 6VDC | 230VAC | 0VDC | 0V | 240VDC |

TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| V 1 | 6SK7GT | 0Ω | .2Ω | 0Ω | 2 Meg. | [illegible] | [illegible] | [illegible] | [illegible] |
| V 2 | 6SA7GT | 0Ω | .2Ω | *5.5KΩ | *5.5KΩ | [illegible] | [illegible] | [illegible] | [illegible] |
| V 3 | 6SK7GT | 0Ω | 0Ω | 0Ω | 1.6 Meg. | [illegible] | [illegible] | [illegible] | [illegible] |
| V 4 | 6SQ7GT | 0Ω | 4.7 Meg | 22Ω | 500KΩ | [illegible] | [illegible] | [illegible] | [illegible] |
| V 5 | 6V6GT | 130Ω | .2Ω | *330Ω | *1500Ω | [illegible] | [illegible] | [illegible] | [illegible] |
| V 6 | 6X5GT | Inf. | .2Ω | 500Ω | .2Ω | 530Ω | [illegible] | [illegible] | [illegible] |

*Measured from pin 8 of V6

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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RCA VICTOR
MODELS 8X71, 8X72

RCA VICTOR
MODELS 8X71, 8X72

RCA VICTOR MODEL 8X71

| | |
|---|---|
| TRADE NAME | RCA Victor, Models 8X71, 8X72 (Ch. RC-1070) |
| MANUFACTURER | RCA Victor Div., Radio Corp. of America, Camden, New Jersey |
| TYPE SET | AC-DC Operated AM-FM Superheterodyne Receiver with Loop Antenna |
| TUBES(SEVEN) | Types 19J6 Converter, 6BJ6 1st IF Amp., 12AU6 FM 2nd IF Amp., 12AL5 Ratio Det., 6AQ6 AM DET-AVC-AF, 35C5 Power Output, 35W4 Rectifier. |
| POWER SUPPLY | 110-120 Volts AC-DC RATING .25 Amp. @ 117 Volts AC |
| TUNING RANGE-BROADCAST | 540-1600KC FREQ. MOD. 88-108MC |

CONTROL KNOBS:

DO NOT ATTEMPT TO REMOVE THE CONTROL KNOBS FROM THE CABINET. The knobs have spring retainers on the inside of the cabinet to prevent their removal. The retainers are accessible only after the chassis has been removed from the cabinet.

Removal of Chassis:

1. Remove the four screws at the corners of the back cover and remove cover.
2. Unhook the pointer from the dial cord.
3. Remove the four screws which hold the chassis to the cabinet (two at sides of chassis base and two on dial cord pulley brackets above the chassis base).
4. Pull the chassis to the rear and remove. The control knobs will be retained.

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

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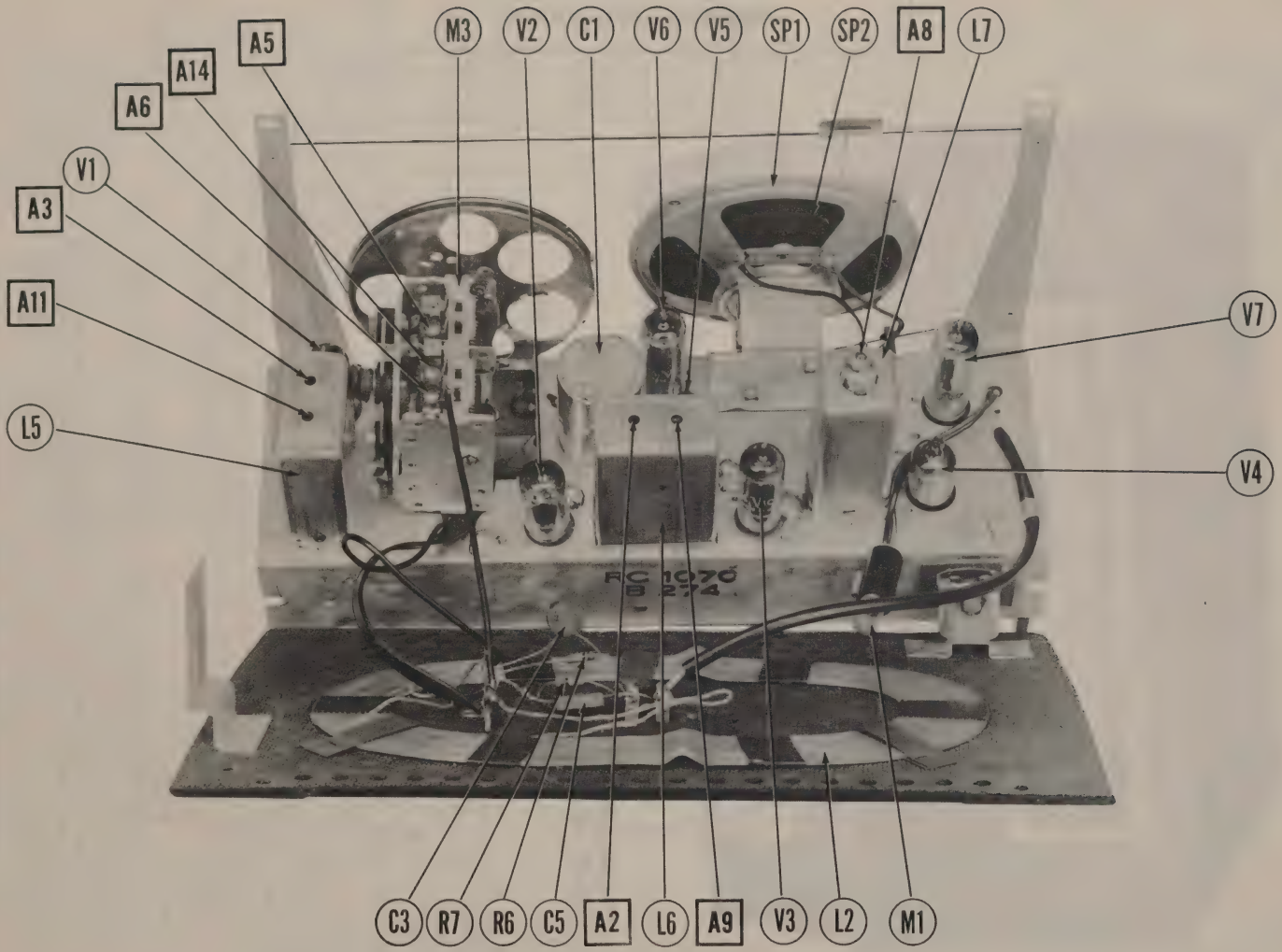
A5
A14
A6
V1
A3
A11
L5
M3
V2
C1
V6
V5
SP1
SP2
A8
L7
V7
V4
C3
R7
R6
C5
A2
L6
A9
V3
L2
M1

C23
R25
C2
C4
R23
R24
R26
L8
C22
C20
C19
R22
R21
C17
R16
C16
R19
C26
R11
R10
R12
C15
C14
R13
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R15
R14
C10
L4
C8
C9
M2
R5
R3
C11
A7
R4
C12
A12
A4
R9
C6
R2
C13
C7
L3

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: RCA PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| V1 | Converter | 19J6 | 19J6 | | |
| V2 | 1st IF Amp. | 6BJ6 | 6BJ6 | | |
| V3 | 2nd FM IF Amp. | 12AW6 | 12AW6 | | |
| V4 | Ratio Det. | 12AL5 | 12AL5 | | |
| V5 | AF DET-AVC-AF | 6AL5 | 6AL5 | | |
| V6 | [illegible] | 7C5 | 35C5 | | |
| V7 | Rectifier | 35W4 | 35W4 | | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: RCA PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| C1A | [illegible] | 150 | 73975 | AF886D4A* | UF44315 C* | | DY-419* | EL-443* | ◓ Filter<br>■ Filter<br>▲ Output Cath. Bypass |
| B | 40 | 150 | | | | | | | |
| C | 20 | 25 | | | | | | | |
| C2 | 2 | 50 | 73747 | PRS150/4 | BR245 | | M-4-150 | TVA-12 | Stabilizing Cap. |
| C3 | [illegible] | | 73473 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | Ext. Ant. Isolation |
| C4 | .5m | 500 | 73640 | 1468-00035 | 5W5T3 | GP2K-300 | MO.5-33 | 1FM-33 | Ant. Coupling |
| C5 | .5m | 500 | 73640 | 1468-0003 | 5W5T3 | GP2K-300 | MO.5-33 | 1FM-33 | " " |
| C6 | [illegible] | | 73851 | 1467-00015 | 1W5T15 | GP2L-3015 | MW.5-215 | 1FM-215 | RF Coupling |
| C7 | 15c | | 49125 | 1468-00015 | 5W5T15 | GP1K-150 | MO.5-315 | 1FM-315 | Osc. Grid Cap. |
| C8 | 15 | | 51333 | | | GP1K-15 | | MS-415 | " " " |
| C9 | 68 | | 33103 | 1468-000075 | 5W5Q7 | GP1K-75 | MOS.5-47 | MS-47 | Osc. Feedback |
| C10 | 56 | | 73867 | | | | | | Fixed Padder |
| C11 | 2 | | 73896 | | | | | | Osc. Feedback |
| C12 | .05 | 400 | 70615 | P488-05 | GT4S5 | | ST-4-05 | TM-15 | AVC Filter |
| C13 | 500 | | 73473 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | Mixer Decoupling |
| C14 | 50 | | 73499 | 1468-00005 | 5W5Q5 | GP1K-50 | MO.5-45 | 1FM-45 | 1st IF Fil. Bypass |
| C15A | 4000 | | 74009 | 1467-004 | 1D5D4 | GP2M-005 | MW.5-24 | 1FM-24 | " " " " |
| B | 4000 | | | 1467-004 | 1D5D4 | GP2M-005 | MW.5-24 | 1FM-24 | RF Bypass |
| C16 | .05 | 100 | 71926 | P688-005 | GT6D5 | GP2M-005 | ST-6-005 | TM-25 | 2nd IF Cath. Bypass |
| C17A | 4000 | | 74009 | 1467-004 | 1D5D4 | GP2M-005 | MW.5-24 | 1FM-24 | 2nd IF Decoupling |
| B | 4000 | | | 1467-004 | 1D5D4 | GP2M-005 | MW.5-24 | 1FM-24 | 2nd IF Fil. Bypass |
| C18A | 200 | | Note 1 | 1468-0002 | 5W5T2 | GP2K-200 | MO.5-32 | 1FM-32 | Diode Filter |
| B | 200 | | Note 1 | 1468-0002 | 5W5T2 | GP2K-200 | MO.5-32 | 1FM-32 | " " |
| C19 | .00 | 500 | 73640 | 1468-0003 | 5W5T3 | GP2K-300 | MO.5-33 | 1FM-33 | Diode Load Cap Note 2 |
| C20 | 00 | 500 | 73640 | 1468-0003 | 5W5T3 | GP2K-300 | MO.5-33 | 1FM-33 | " " " " " |
| C21 | .002 | 200 | 73750 | P688-002 | GT6D2 | GP2M-002 | ST-6-002 | TM-22 | De-emphasis |
| C22A | 4000 | | 74009 | 1467-004 | 1D5D4 | GP2M-005 | MW.5-24 | 1FM-24 | AVC Filter |
| B | 4000 | | | 1467-004 | 1D5D4 | GP2M-005 | MW.5-24 | 1FM-24 | " " " |
| C23 | .01 | 100 | 71923 | P488-01 | GT2S1 | GP2-335-01 | ST-4-01 | TM-11 | Audio Coupling |
| C24 | .01 | 100 | 71923 | P488-01 | GT2S1 | GP2-335-01 | ST-4-01 | TM-11 | " " |
| C25 | 56 | | 73499 | 1468-00005 | 5W5Q5 | GP1K-50 | MO.5-45 | 1FM-45 | RF Bypass |
| C26 | 150 | 500 | 39685 | 1468-0001 | 5W5T1 | GP1K-100 | MO.5-31 | 1FM-31 | AF Plate Bypass |
| C27 | .001 | 400 | 73146 | P688-001 | GT6D1 | GP2L-001 | ST-6-001 | TM-21 | Audio Coupling |
| C28 | .2 | 400 | 74013 | P488-02 | GT4S2 | | ST-4-02 | TM-12 | Output Plate Bypass |
| C29 | 3000 | | 73473 | 1467-005 | 1D5D5 | GP2M-005 | MW.5-25 | 1FM-25 | RF Bypass |
| C30 | .05 | 400 | 70615 | P488-05 | GT4S5 | | ST-4-05 | TM-14 | " " |

* Parallel sections to obtain desired capacity.
Note 1. Items C18A, C18B, and R11 are combined into one unit obtainable under MFGRS Part # 74011.
Note 2. When either Item C19 or C20 are replaced, replace both with capacitors of equal value.

## CONTROLS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: RCA PART No. | IRC PART No. | CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| R1A | 1 Meg. | ½ | 36406 | D13-137 | M-63-Z | Volume control |
| B | Shaft | | Not Req. | A | Not Req. | Attach to R1A Per Instructions |
| C | Switch | | Not Req. | 41 | SW-A | " " " " " |

# PARTS LIST AND DESCRIPTIONS (Continued)

## DIAL LIGHTS

| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA: RCA PART No. | REPLACEMENT DATA: | NOTES |
|---|---|---|---|---|---|---|---|
| M1 | Bayonet | 6-8V | 0.15A | Brown | 32480 | | Type #47 |

## MISCELLANEOUS

| ITEM No. | PART NAME | RCA PART No. | NOTES |
|---|---|---|---|
| M2 | Switch | 73977 | Band |
| M3 | 2 Gang Var. Cap. | 73973 | (18-382MMF, 25-202MMF) |
| | Cabinet | Y2051 | Maroon (8X71) |
| | Cabinet | Y2052 | Ivory (8X72) |
| | Dial | 73990 | |
| | Dial Pointer | 73991 | |
| | Knob | 73982 | Brown (8X71) |
| | Knob | 73983 | Ivory (8X72) |

# PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | RCA PART No. | IRC PART No. | |
| R2 | 3.3 Meg. | ½ | | BTS-3.3 Meg. | Converter Grid |
| R3 | 15Ks | ½ | | BTS-15K | Osc. Grid |
| R4 | 1000Ω | ½ | | BTS-1000 | Osc. Coil Shunt |
| R5 | 100Ω | ½ | | | Osc. Grid |
| R6 | 1 Meg. | ½ | | BTS-1 Meg. | Ant. Loading |
| R7 | 1 Meg. | ½ | | BTS-1 Meg. | Ant. Coupling |
| R8 | 2.2 Meg. | ½ | | BTS-2.2 Meg. | AVC Network |
| R9 | 680Ω | ½ | | BTS-680 | Converter Decoupling |
| R10 | 68Ks | ½ | | | IF Cathode |
| R11 | 47Ks | ½ | Note 1 | BTS-47K | Diode Filter |
| R12 | 18Ks | ½ | | BTS-18K | " " |
| R13 | 18Ks | ½ | | BTS-18K | Diode Load |
| R14 | 1Mks | ½ | | BTS-1Mk | Tone Compensation |
| R15 | 39Ks | ½ | | BTS-39K | AVC Network |
| R16 | 1Mks | ½ | | | 2nd FM IF Cathode |
| R17 | 680Ω | ½ | | BTS-680 | Decoupling |
| R18 | 22 Meg. | ½ | | BTS-22 Meg. | Delayed AVC Network |
| R19 | 68Ks | ½ | | BTS-680K | AF Plate |
| R20 | 10 Meg. | ½ | | BTS-10 Meg. | AF Grid |
| R21 | 1Mks | ½ | | | Balancing |
| R22 | 34Ks | ½ | | BTS-34K | De-emphasis |
| R23 | 1250Ω | ½ | | BTS-1200-5% | Balancing |
| R24 | 39Ks | ½ | | BTS-39K-5% | Ratio Set. Diode Load 5% |
| R25 | 3300Ω | ½ | | BTS-3300-5% | Balancing 5% |
| R26 | 2.2 Meg. | ½ | | BTS-2.2 Meg. | AVC Network |
| R27 | 68Ks | ½ | | BTS-68K | Output Grid |
| R28 | 180Ks | 1 | | RW-2-180 | Output Cathode |
| R29 | 100Ks | 1 | | BTA-100S | Filter. |

Note 1. Items C18A, C18B and R11 are combined into one unit obtainable under MFGRS Part # 74011.

## TRANSFORMER (OUTPUT)

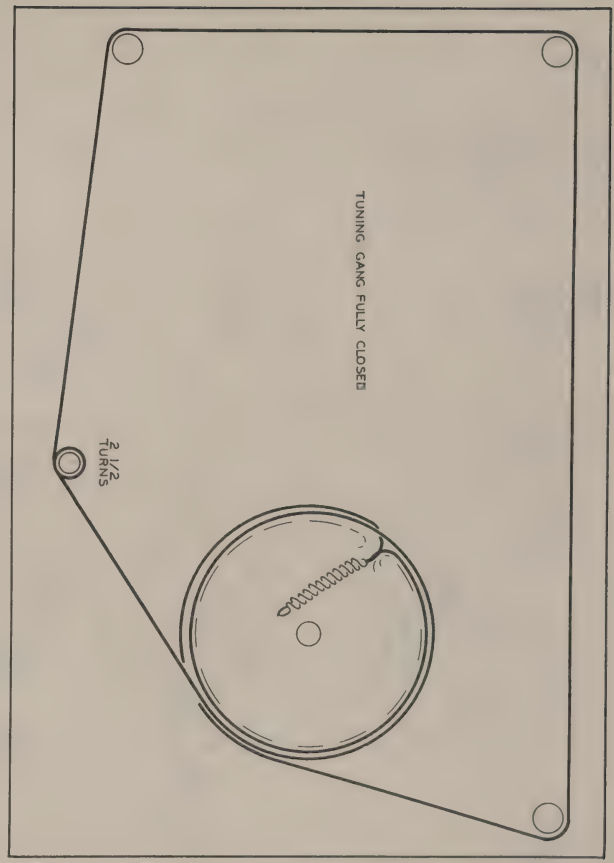
| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | RCA PART No. | STANCOR PART No. | CHICAGO PART No. | MERIT PART No. | |
| | PRI. | SEC. | PRI. | SEC. | | | | | |
| T1 | 3400Ω | 3.4Ω | 200Ω Tap @ 13.5Ω | .6Ω | 73976 | A-3330 | RO-3 | A-3031 | |

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| | FIELD | V. C. IMP. | RCA PART No. | JENSEN PART No. | QUAM PART No. | |
| SP1 | PM | 3.2Ω | 73900 | ST-10C M.D.15-X‡ | 5A07‡ | ‡ Drill & tap magnet frame. |
| SP2 | C.E. FLD. 4.8 W | V. C. IMP. 9.1Ω | | | | |

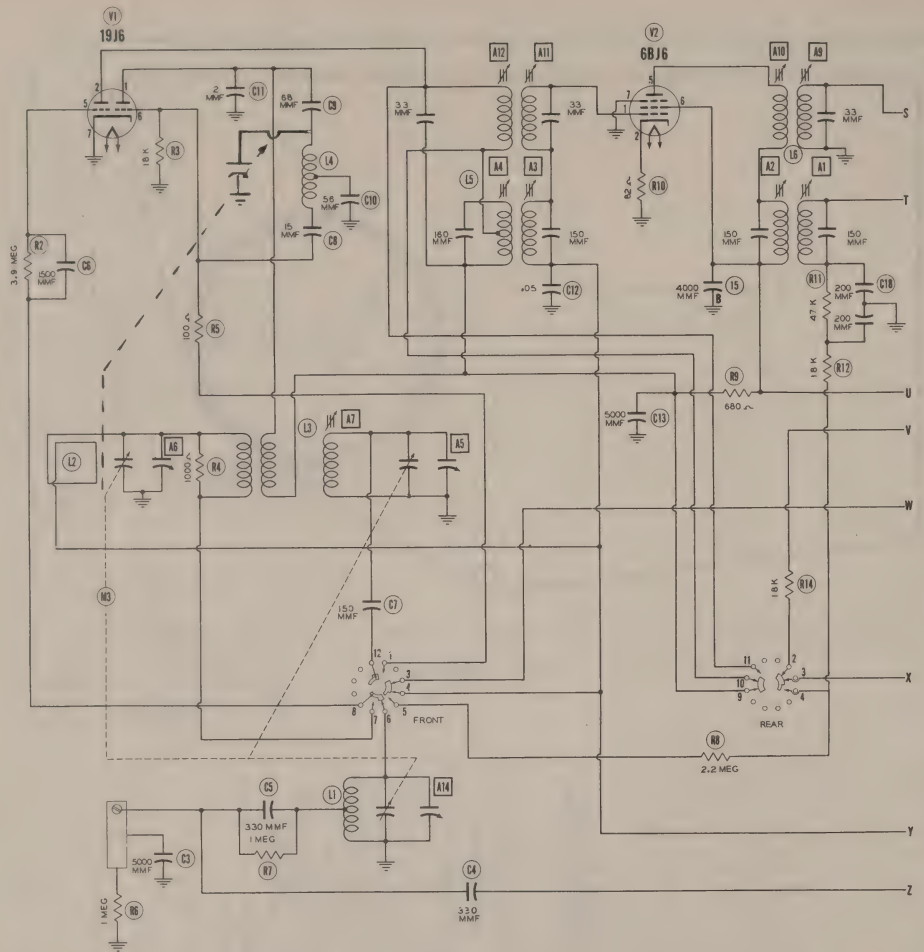
## R F COILS

| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | |
|---|---|---|---|---|---|---|
| | | PRI. | SEC. | RCA PART No. | MEISSNER PART No. | |
| L1 | FM Ant. | Ω | | 74013 | | |
| L2 | AM Loop Ant. | 1Ω | | 73980 | | |
| L3 | AM Osc. | 1Ω † | 6.8Ω | 73944 | | † Pickup coil resistance 2Ω |
| L4 | FM Osc. | Ω | | 74012 | | |
| L5A | FM 1st IF | .5Ω | .3Ω | 73945 | | |
| L5 | AM 1st IF | 4Ω ST | 4Ω | 73945 | | |
| L6A | FM 2nd IF | 1Ω | .5Ω | 73946 | | |
| L6 | AM 2nd IF | 1Ω | 1Ω | 73946 | | |
| L7 | Det. Sec. | .5Ω | .3Ω | 73948 | | |
| L8 | FM Det. Sec. | Ω | | | | |
| L9 | FM Det. Pri. | Ω | | | | |






DATE 6/49 4 911-15 SET #63 FOLDER 15




VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 |
|---|---|---|---|---|---|---|---|---|
| V 1 | | -6VDC | -6VDC | -6VDC | 0VDC | -.4VDC | -.4VDC | 0V |
| V 2 | | -.4VDC | -.4VDC | -6VDC | -6VDC | 250VDC | 6VDC | 0V |
| V 3 | | 0V | 0V | -6VDC | 1.1VDC | 6VDC | 6VDC | -.4VDC |
| V 4 | | 0VDC | -.4VDC | -.4VDC | 0V | -.2VDC | 0V | -.2VDC |
| V 5 | | -.4VDC | 0V | -.4VDC | 105VDC | -.4VDC | -.4VDC | 0.2VDC |
| V 6 | | -.4VDC | 0V | -6VDC | 250VDC | 0V | 6VDC | 105VDC |
| V 7 | | 117VAC | 0V | -6VDC | -.4VDC | 1.1VDC | -.4VDC | 105VDC |

‡TAKEN WITH VACUUM TUBE VOLTMETER.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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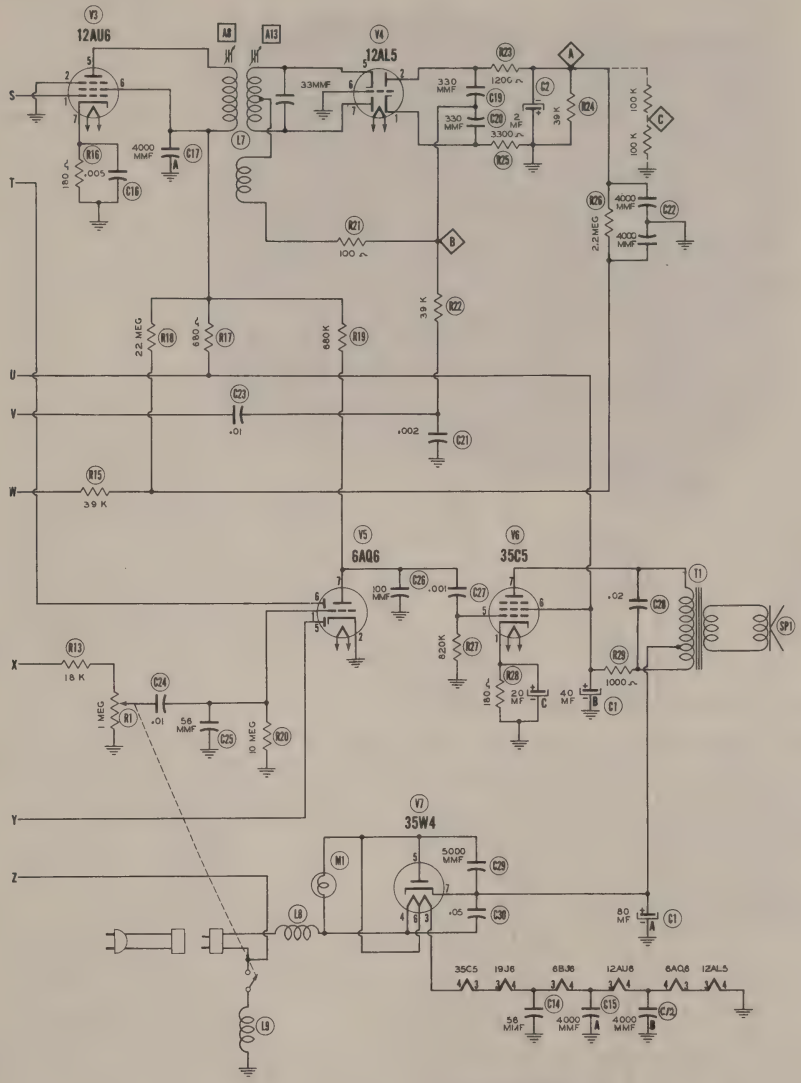


RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 |
|---|---|---|---|---|---|---|---|---|
| V1 | 12AU6 | *1.3KΩ | *1.3KΩ | 54Ω | 30Ω | 5Meg. | 1MΩ | 0Ω |
| V2 | 6BJ6 | 2.5Meg. | +2Ω | 3Ω | 30Ω | *100Ω | *160Ω | 0Ω |
| ‡ V3 | 12AU6 | .5Ω | 0Ω | 30Ω | 19Ω | *1.3KΩ | *1.3KΩ | 180Ω |
| ‡ V4 | 12AL5 | 5.3KΩ | 39KΩ | 12Ω | 0Ω | Inf. | 0Ω | Inf. |
| V5 | 6AQ6 | 1.2Meg. | 0Ω | 14Ω | 1Ω | 2.6Meg. | 100KΩ | *750KΩ |
| V6 | 35C5 | 1MΩ | Inf. | 54Ω | 6Ω | 90KΩ | *100KΩ | *250Ω |
| V7 | 35W4 | 11Ω | Inf. | 85Ω | 11Ω | 11KΩ | 110Ω | 3Meg. |

* Measured from pin 7 of V7

‡ VOLTAGE AND RESISTANCE READINGS TAKEN IN FM POSITION

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## ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap fully closed and set left hand edge of dial pointer saddle 2 1/16" from the center of the upper left hand pully.

When adjusting AM IF transformers, shunt plate winding with 10KΩ resistor when aligning the secondary trimmer. Remove shunt and place across the secondary and adjust primary trimmer. Align both AM IF transformers using this method.

Use isolation transformer if available. If not, connect a .1MFD cap. in series with low side of signal generator and chassis.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

### AM ALIGNMENT

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1. | .01MFD | High side to rear AM section of tuning cap. Low side to chassis. | 455KC | BC (clock-wise) | Tuning cap fully closed | Across voice coil | A1, A2 A3, A4 | Adjust for maximum output. If isolation transformer is not used reduce dummy antenna to .001MFD to reduce hum modulation. See Pre-alignment instructions. |
| 2. | | Loop | 1020KC | " | Tuning cap fully open | " | A5 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |
| 3. | | Loop | 1400KC | " | Tune for maximum output | " | A6 | Adjust for maximum output. |
| 4. | | Loop | 600KC | " | 600KC (3 3/16"from pulley to left edge of pointer saddle) | " | A7 | Rock tuning cap and adjust for maximum output. Repeat steps 2, 3, & 4. |

### FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Before starting step 5 connect two matched 100KΩ (± 5%) resistors in series across stabilizer capacitor C2. Connect common lead of VTVM at junction of these two resistors (point C) and the DC probe to point B as shown on schematic.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 5. | .01MFD | High side to pin 1 (Grid) 12AU6 (V3). Low side to chassis. | 10.7MC (400 Mod.) | FM (counter clock-wise) | Tuning cap fully closed | DC Probe to point A. Common to chassis. | A8 | Adjust for maximum deflection. |
| 6. | .01MFD | High side to pin 1 (Grid) 6BJ6 (V2). Low side to chassis. | " | " | " | " | A9,A10 | " " " " |
| 7. | .01MFD | High side to pin 5 (Grid) 19J6 (V1). Low side to chassis. | " | " | " | " | A11, A12 | " " " " |
| 8. | .01MFD | " | " | " | " | DC Probe to point B. Common to point C. | A13 | Adjust for minimum audio output and zero reading on VTVM. A positive and negative reading will be found on either side of the correct setting. |

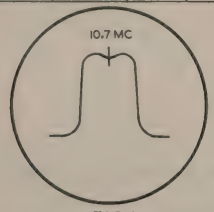



FIG. 1

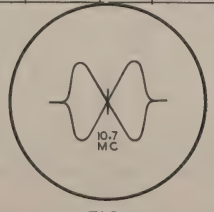



FIG. 2

### FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

When aligning FM IF transformers L5 and L6, alternately load the primary and secondary windings with 680Ω resistor. That is: connect the resistor across the primary and adjust the secondary. Remove the resistor and place it across the secondary and adjust the primary.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | SCOPE CONNECT | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 5. | .01MFD | High side to pin 1 (Grid) 6BJ6 (V2). Low side to chassis. | 10.7MC (450KC Sweep) | FM | Tuning cap fully closed | Vert. Amp. to point A. Low side to chassis. | A8, A9 A10 | Disconnect stabilizer cap C2. Adjust for maximum amplitude and symmetry as per Fig. 1. |
| 6. | .01MFD | High side to pin 5 (Grid) 19J6 (V1). Low side to chassis. | " | " | " | " | A11, A12 | " |
| 7. | .01MFD | " | " | " | " | Vert. Amp. to point C. Low side to chassis. | A13 | Reconnect stabilizer cap C2. Adjust for crossover at center of pattern per Fig. 2. Slightly retouch A8 for maximum amplitude and straightness of cross over lines. Continue with step 9. |

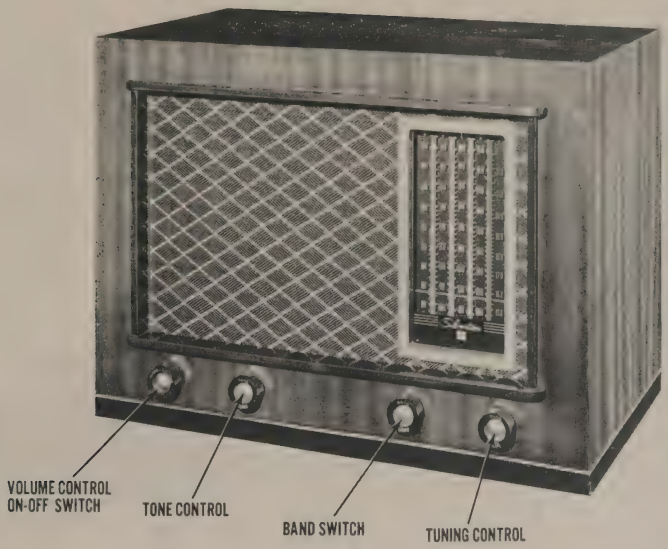
### FM RF ALIGNMENT

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 9. | 300Ω carbon res. | High side thru 300Ω to terminal 1 of antenna strip. Low side to term 2. | 106MC | FM | 106MC (6 7/8"from center of left hand pully to left edge of pointer saddle). | DC Probe to point A. Common to chassis. | L4 | L4 may be adjusted for maximum deflection, if necessary, by increasing or decreasing spacing between turns. |
| 10 | 300Ω carbon res. | " | " | " | " | " | A14 | Adjust for maximum deflection. |
| 11 | 300Ω carbon res. | " | 90MC | " | 90MC (3 9/16"from pulley to left edge of pointer saddle.) | " | L1 | If necessary, rock tuning cap. and vary spacing of turns of L1 for maximum deflection. |

### CRITICAL LEAD DRESS

1. All connections in the mixer-oscillator circuit are extremely critical both in regard to lead length and lead dress. Do not disturb unless necessary -- make careful notation before servicing if it becomes necessary to disturb the wiring.
2. The ground lead from pin 2 of V3 (12AU6) is critical in length and must be dressed down against the chassis.
3. Dress audio coupling capacitor C24 away from output transformer.
4. Dress diode filter unit away from alignment hole in L6.
5. Dress grid lead of V3 (pin 1 of 12AU6) against chassis apron.
6. Dress plate lead of V1 (pin 2 of 19J6) against chassis.
7. Dress loop antenna leads so as to prevent contact with external antenna terminal board.
8. All ground connections to chassis should be restored to original place of connection if disturbed.
9. Dress capacitor C7 down close to range switch so as to clear the projection on the bottom of the cabinet.
10. The FM ant. and osc. coils must be cemented to the coil support to prevent microphonic howl on FM.

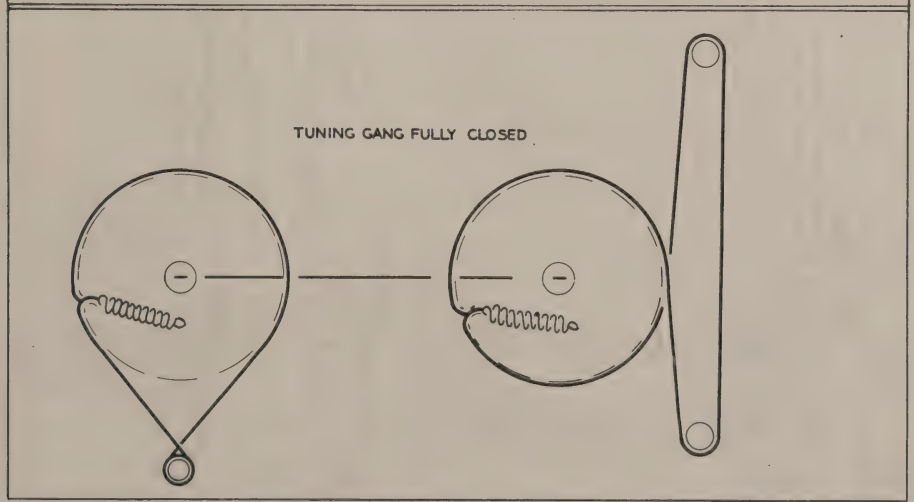
SILVERTONE MODEL
9054 (Ch. 101.849)




SILVERTONE MODEL
9054 (Ch. 101.849)

SILVERTONE MODEL 9054

| | |
|---|---|
| TRADE NAME | Silvertone, Model 9054 (Ch. 101.849) |
| SUPPLIER | Sears, Roebuck & Co., 925 S. Homan St., Chicago, Illinois |
| TYPE SET | AC Operated Multi-Band Superheterodyne Receiver |
| TUBES(SIX) | Types 7H7 RF Amp., 7Q7 Converter, 7A7 IF Amp., 7C6 DET-AVC-AF, 7C5 Power Output 7Y4 Rectifier |
| POWER SUPPLY | 110, 125, 145, 200, 220, 245 Volts AC RATING .94 Amp. @ 117 Volts AC |
| TUNING RANGE | Band A 535-1650KC, Band B 1.65-4.6MC, Band C 4.6-10MC, Band D 10-15.6MC, Band E 15.6-22.1MC |




DIAL CORD DRIVE

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DATE 6/49 4911-16 SET #63 FOLDER 16

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: SILVERTONE PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| 1 | RF Amp. | 7H7 | 7H7 | 8V | |
| 2 | Converter | 7Q7 | 7Q7 | 8AL | |
| 3 | IF Amp. | 7A7 | 7A7 | 8V | |
| 4 | DET.-AVC-AF | 7C6 | 7C6 | 8W | |
| 5 | Power Output | 7C5 | 7C5 | 6AA | |
| 6 | Rectifier | 7Y4 | 7Y4 | 5AB | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: SILVERTONE PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| 7A | 40 | 400 | R65076 | AF4444J* | UP4445 | | DY-4x20-450* | EL-420* | ▬ Filter |
| B | 40 | 400 | | PRS450/20 | BR2045 | | M-20-450 | UT-20 | ■ Filter |
| C | 80 | 400 | | | | | | | ▲ Filter |
| 8 | .005 | 600 | | P688-005 | GT6D5 | GP2M-005 | ST-6-005 | TM-25 | Output Plate Bypass |
| 9 | .01 | 400 | | P488-01 | GT4S1 | GP2-335-01 | ST-4-01 | TM-11 | Audio Coupling |
| 10 | .002 | 600 | | P688-002 | GT6D2 | GP2M-002 | ST-6-002 | TM-22 | " " |
| 11 | .004 | 400 | | P488-004 | GT6L4 | GP2M-005 | ST-6-004 | TM-24 | Tone Comp. |
| 12 | .01 | 400 | | P488-01 | GT4S1 | GP2-335-01 | ST-4-01 | TM-11 | " " |
| 13 | .01 | 400 | | P488-01 | GT4S1 | GP2-335-01 | ST-4-01 | TM-11 | Audio Coupling |
| 14 | .2 | 200 | | P488-2 | GT2P25 | | ST-4-2 | TC-2 | IF Cath. Bypass |
| 15 | .05 | 400 | | P488-05 | GT4S5 | | ST-4-05 | TM-15 | Conv. Plate Decoup. |
| 16 | .05 | 400 | | P488-05 | GT4S5 | | ST-4-05 | TM-15 | Decoupling |
| 17 | .1 | 400 | | P488-1 | GT4P1 | | ST-4-1 | TM-1 | " |
| 18 | .05 | 200 | | P488-05 | GT2S5 | | ST-4-05 | TM-15 | AVC Filter |
| 19 | .05 | 200 | | P488-05 | GT2S5 | | ST-4-05 | TM-15 | " " |
| 20 | .002 | 600 | | P688-002 | GT6D2 | GP2M-002 | ST-6-002 | TM-22 | Ant. Coupling |
| 21 | .05 | 200 | | P488-05 | GT2S5 | | ST-4-05 | TM-15 | RF Cath. Bypass |
| 22 | 250 | 500 | | 1468-00025 | 5W5T25 | GP2K-250 | MO.5-325 | 1FM-325 | AF Plate Bypass |
| 23 | 50 | 500 | | 1469-00005 | 5W5Q5 | GP1K-50 | MO.5-45 | 1FM-45 | Osc. Grid Cap. |
| 24 | 1000 | 500 | | 1468-001 | 1W5D1 | | MW.5-21 | 1FM-21 | Fixed Padder |
| 25 | 50 | 500 | R46109 | 1469-00005 | 5R5Q5 | NP0M-50 | MOS.5-45 | MS-45 | Fixed Trimmer |
| 26 | 50 | 500 | | 1468-00005 | 5W5Q5 | GP1K-50 | MO.5-45 | 1FM-45 | RF Coupling |

* Parallel sections to obtain desired capacity.

## CONTROLS

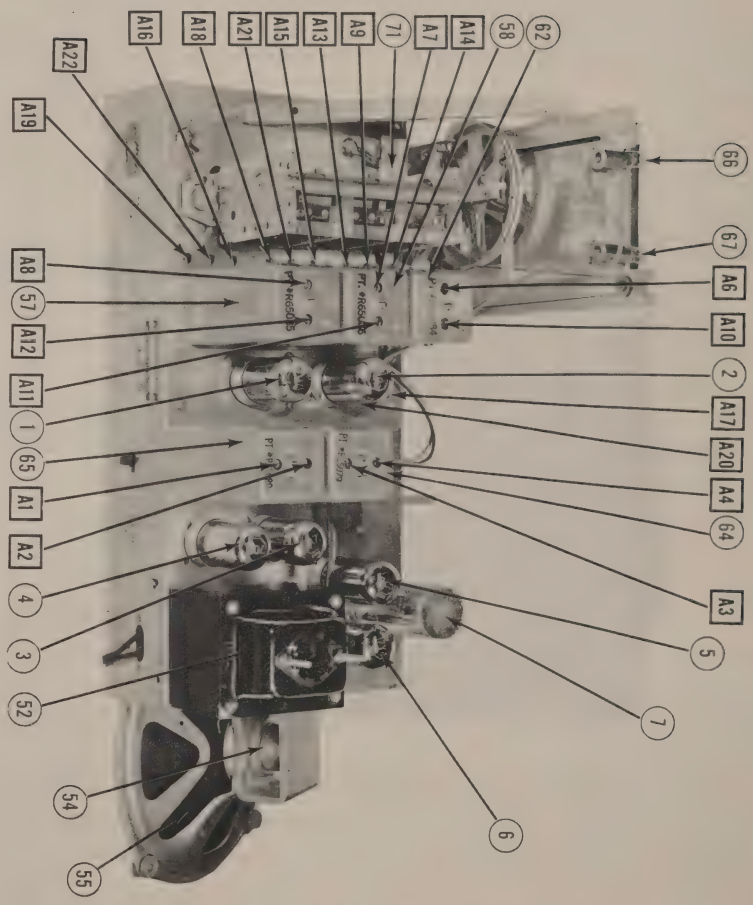
| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: SILVERTONE PART No. | IRC PART No. | CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| 27A | 2 Meg. | ½ | R65073 | D13-139X | AT-115 | Volume control |
| B | Shaft | | Not Req. | E # | KSS-3# | Attach to 27A Per Instructions |
| C | Switch | | Not Req. | 41 | SW-A | " " " |
| 28A | 500KΩ | ½ | R65072 | D13-133 | AM-60-Z | Tone control |
| B | Shaft | | Not Req. | E # | KSS-3# | Attach to 28A Per Instructions |

# Saw out slot in shaft.

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: SILVERTONE PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| 29 | 100KΩ | ½ | | BTS-100K | Ant. Loading |
| 30 | 270Ω | ½ | | BW-½-270 | RF Cathode |
| 31 | 10Ω | ½ | | BW-½-10 | Parasitic Suppressor |
| 32 | 270Ω | ½ | | BW-½-270 | IF Cathode |
| 33 | 10KΩ | ½ | | BTS-10K | Converter Grid |
| 34 | 2.2 Meg. | ½ | | BTS-2.2 Meg. | AVC Network |
| 35 | 4.7 Meg. | ½ | | BTS-4.7 Meg. | " " |
| 36 | 4.7 Meg. | ½ | | BTS-4.7 Meg. | " " |
| 37 | 2.2 Meg. | ½ | | BTS-2.2 Meg. | " " |
| 38 | 1Ω | ½ | | BW-½-10 | Parasitic Suppressor |
| 39 | 22KΩ | ½ | | BTS-22K | Osc. Grid |
| 40 | 1000Ω | ½ | | BTS-1000 | Converter Plate Decoupling |
| 41 | 2200Ω | ½ | | BTS-2200 | IF Cathode |

# CHASSIS—TOP VIEW



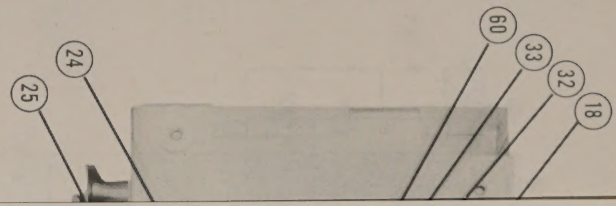
## PARTS LIST AND DESCRIPTI

| ITEM No. | RATING | | REPLACEMENT DATA | | |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | SILVERTONE PART No. | IRC PART No. | |
| 42 | 8200Ω | 2 | | BTS-8200 | IF Scree |
| 43 | 15 Meg. | ½ | | BTS-15 Meg. | AF Grid |
| 44 | 220KΩ | ½ | | BTS-220K | AF Plat |
| 45 | 56KΩ | ½ | | BTS-56K | Tone C |
| 46 | 470KΩ | ½ | | BTS-470K | Output |
| 47 | 270Ω | 1 | | BW-1-270 | Output |
| 48 | 1 Meg. | ½ | | BTS-1 Meg. | Isola |
| 49 | 56Ω | ½ | | BW-½-56 | Paras |
| 50 | 1800Ω | 2 | | BW-2-1800 | Filte |
| 51 | 2200Ω | 2 | | BW-2-2200 | " |

### TRANSFORMER

| ITEM | RATING |
|---|---|

## CHASSIS—BOTTOM VIEW

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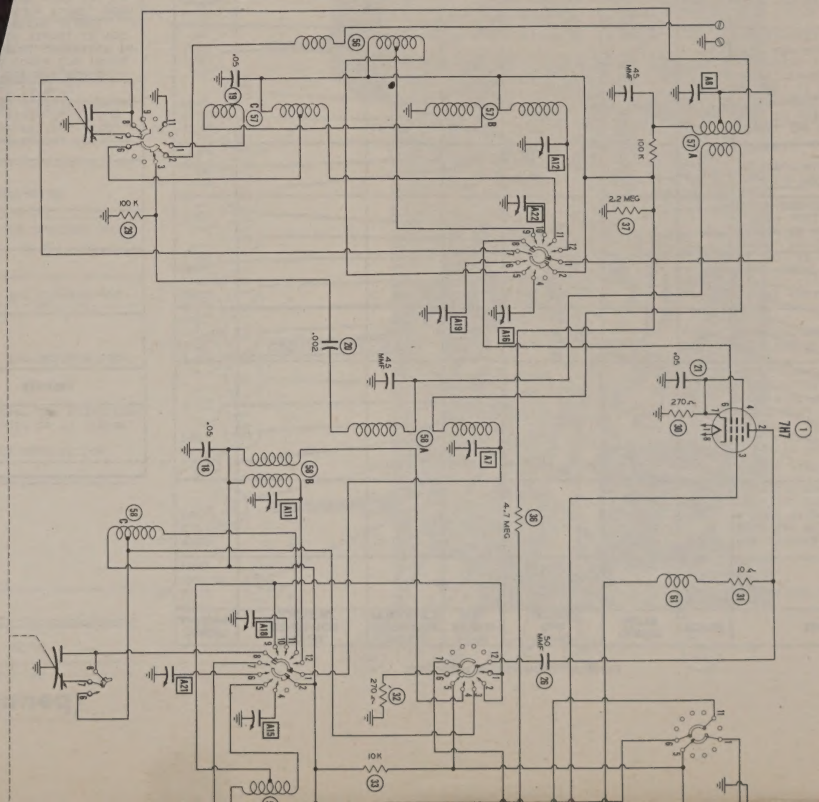

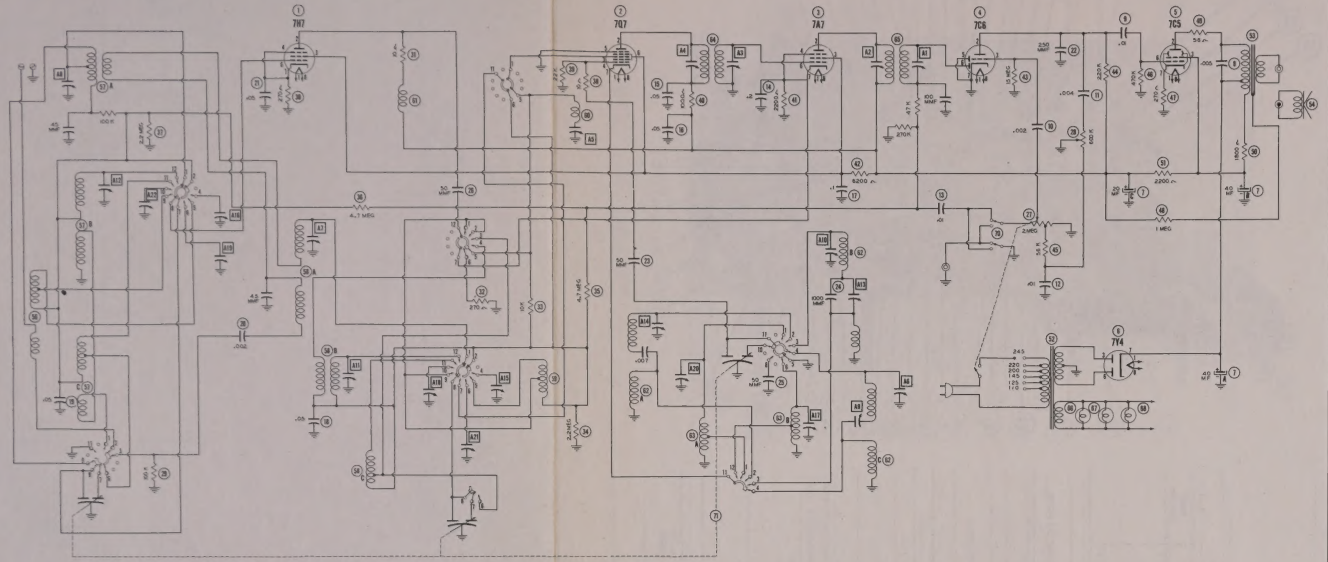


VOLTAGE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 7N7 | 0V | 260VDC | 110VDC | 0VDC | 0V | 0V | 0VDC | 7VAC |
| 2 | 7N7 | 7VAC | 260VDC | 110VDC | 5-10VDC | 0V | -1.5VDC | 0V | 0V |
| 3 | 7A7 | 0V | 230VDC | 110VDC | 7-9VDC | 0V | 0V | 7VAC | 7VAC |
| 4 | 7C6 | 7VAC | 180VDC | 4-7VDC | 0V | -1.4VDC | 0V | 0V | 0V |
| 5 | 7C5 | 0V | 260VDC | 260VDC | 120VDC | 260VDC | 1VDC | 13.5VDC | 7VAC |
| 6 | 7T4 | 7VAC | 340VDC | 350VAC | 350VDC | 345VAC | 340VAC | 330VDC | 0V |

(TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE MEASUREMENTS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 7N7 | 0Ω | *680Ω | *120KΩ | 470Ω | 0Ω | 1.6Meg. | 270Ω | .2Ω |
| 2 | 7N7 | .2Ω | *680Ω | *120Ω | 220Ω | 0Ω | 1.6Meg. | .3Ω | 0Ω |
| 3 | 7A7 | 0Ω | *2.6Ω | *125Ω | 1.2KΩ | 0Ω | 0Ω | 1.2KΩ | .2Ω |
| 4 | 7C6 | .6Ω | *6.8MΩ | 330Meg. | 0Ω | 300KΩ | 0Ω | 0Ω | 0Ω |
| 5 | 7C5 | 0Ω | *90KΩ | *1.5KΩ | 350KΩ | 200KΩ | 500Ω | 270Ω | .2Ω |
| 6 | 7T4 | .2Ω | 400Ω | 170Ω | 400KΩ | 400KΩ | 150Ω | 400KΩ | 0Ω |

* Measured from pin 7 of 7T4

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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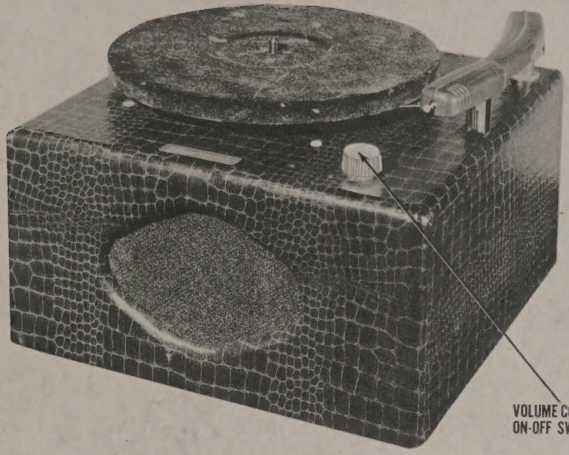
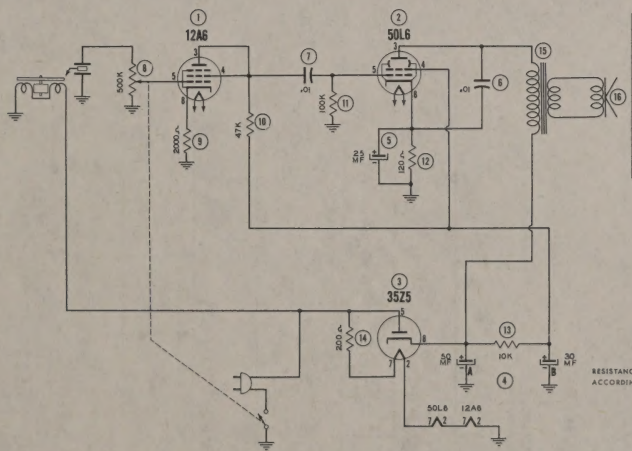



SUPREME MODEL 712S

**TRADE NAME** Supreme, Model 712S
**MANUFACTURER** Aim Industries, 41 Union Square, New York 3, New York
**TYPE SET** AC Operated Record Player with 3 Tube Amplifier
**TUBES** (THREE) Types 12A6GT AF Amp., 50L6GT Power Output, 35Z5GT Rectifier

**POWER SUPPLY** 110-120 Volts AC RATING .20 Amp., @ 117 Volts AC




| Pin No. | 12A6GT Volt. | 12A6GT Res. | 50L6GT Volt. | 50L6GT Res. |
|---|---|---|---|---|
| 1 | 0V | 0Ω | 0V | 0Ω |
| 2 | 0V | 0Ω | 12VAC | 1Ω |
| 3 | 20VDC | 80KΩ | 140VDC | 20KΩ |
| 4 | 20VDC | 80KΩ | 65VDC | 30KΩ |
| 5 | 0V | 0Ω | 0V | 100KΩ |
| 6 | 20VDC | 80KΩ | 0V | Inf. |
| 7 | 12VAC | 1Ω | 58VAC | 6Ω |
| 8 | 1.7VDC | 2KΩ | 4VDC | 120Ω |

| Pin No. | 35Z5GT Volt. | 35Z5GT Res. |
|---|---|---|
| 1 | 0V | Inf. |
| 2 | 58VAC | 6Ω |
| 3 | 65VAC | 7Ω |
| 4 | 145VAC | 20KΩ |
| 5 | 117VAC | 35Ω |
| 6 | 0V | 0Ω |
| 7 | 90VAC | 9Ω |
| 8 | 145VDC | 20KΩ |

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: SUPREME PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | INSTALLATION NOTES |
|---|---|---|---|---|---|
| 1 | 1st AF | 12A6GT | 12A6GT | 7AC | |
| 2 | Power Output | 50L6GT | 50L6GT | 7AC | |
| 3 | Rectifier | 35Z5GT | 35Z5GT | 6AD | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: SUPREME PART No. | AEROVOX PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | SOLAR PART No. | SPRAGUE PART No. | IDENTIFICATION CODES AND INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| 4A | 50 | 150 | | PRSA5030 10* | EDL5315 | | DSB-5030-150 | TA-530 | Filter Red |
| B | 30 | 150 | | | | | | | Filter Yellow |
| 5 | 25 | 35 | | PRS50/25 | BR255 | | M-25-50 | TA-525 | Cathode Bypass |
| 6 | .01 | 600 | | 684-01 | GT6S1 | GP2-335-01 | ST-6-01 | T6-11 | Output Plate Bypass |
| 7 | .01 | 200 | | 484-01 | GT4S1 | GP2-335-01 | ST-4-01 | T6-11 | Audio Coupling |

* Omit Bypass Section.

## CONTROLS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: SUPREME PART No. | IRC PART No. | CLAROSTAT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| 8A | 500KΩ | ½ | | D13-133 | M-60-Z | Volume Control |
| B | Shaft | | | A | Not Req. | Attach to 8A Per Instructions. |
| C | Switch | | | 41 | SW-A | " " " " " |

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: SUPREME PART No. | IRC PART No. | IDENTIFICATION CODES | |
|---|---|---|---|---|---|---|
| 9 | 200Ω | ½ | | BTS-200 | Red-Blk.-Red | AF Cathode |
| 10 | 47KΩ | ½ | | BTS-47K | Y1.-V1.-Or. | AF Plate Load |
| 11 | 100KΩ | ½ | | BTS-100K | Br.-Blk.-Y1. | Output Grid |
| 12 | 12Ω | ½ | | BW-½-120 | Br.-Red-Br. | Output Cathode |
| 13 | 10KΩ | ½ | | BTS-10K | Br.-Blk.-Or. | Filter |
| 14 | 200Ω | 10 | | AB-200 | | Line Dropping |

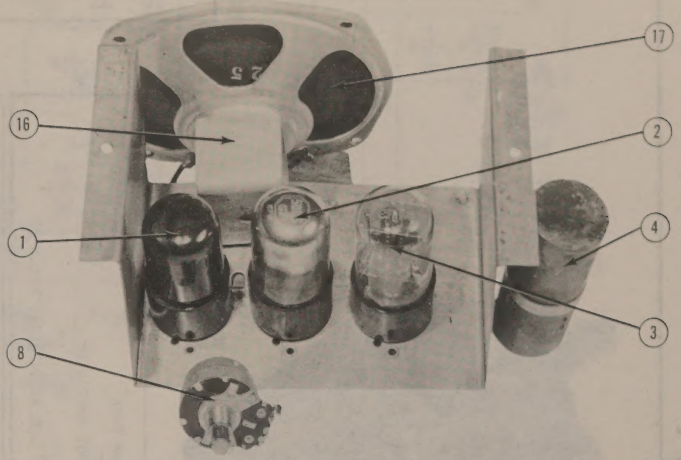
## TRANSFORMER (OUTPUT)

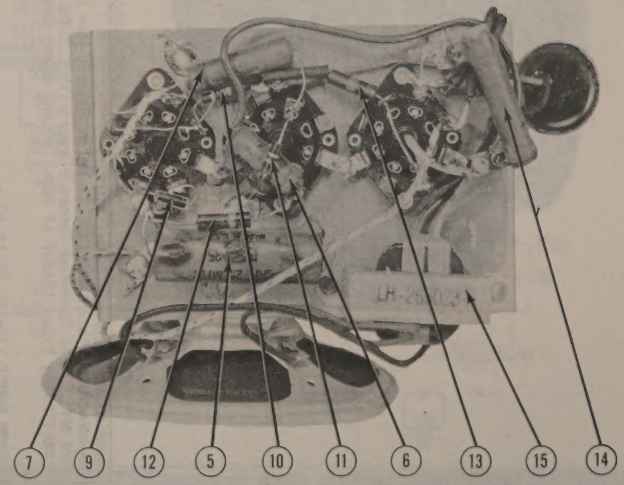
| ITEM No. | RATING: IMPEDANCE PRI. | RATING: IMPEDANCE SEC. | RATING: DC RES. PRI. | RATING: DC RES. SEC. | REPLACEMENT DATA: SUPREME PART No. | STANCOR PART No. | CHICAGO PART No. | MERIT PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|---|
| 15 | 2000Ω | 3.3Ω | 160Ω | .6Ω | | A-3876 | RO-2 | A-2928 | |

## SPEAKER

| ITEM No. | RATINGS | | REPLACEMENT DATA: SUPREME PART No. | JENSEN PART No. | QUAM PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|
| 16 | FIELD | V. C. IMP. | | ST-105 † MOD. P5-X | 5A15 † | † Drill and tap magnet frame |
| | PM | 3.3Ω | | | | |
| 17 | CONE DIA. | V. C. DIA. | | | | |
| | 4 1/2" | 9/16" | | | | |

## CHASSIS—TOP VIEW




## CHASSIS—BOTTOM VIEW